AP42 Section:	9.10.2
Title:	Comments and letters from industry and contractor -

PEANUT BUTTER AND NUT PROCESSORS ASSOCIATION

9005 Congressional Court
Potomac, MD 20854
Fax: (301) 365-7705

RUSSELL E. BARKER
Managing Director
(301) 365-2521

JAMES E. MACK, CAE
General Counsel
(301) 365-4080

February 17, 1994

Mr. Dallas W. Safriet
Environmental Engineer
Emission Inventory Branch (MD-14)
Office of Air Quality Planning
and Standards
United States Environmental
Protection Agency
Research Triangle Park, NC 27711

Dear Mr. Safriet:

This letter is in further reference to the report you have developed in draft form, "Section 6.10.2, Salted and Roasted Nuts and Seeds" which will be published as a supplement to *Compilation of Air Pollutant Emission Factors*, and the correspondence of James Mack, most recently, his letter of January 24, 1994. Mr. Mack is, as noted in his letter, traveling at this time, and I am writing to advise you of comments we have received since January 24.

Quoted below are portions of additional responses:

> "...Interestingly, in reviewing the peanut portion of the write-up, it came to mind that both weather conditions, planting, and harvesting under certain moisture conditions may create as much particulate matter in the air as the direct processing. Regardless, what is put back into the air is predominantly the product from the ground and soil. Can't imagine it to be a major problem."

> "The Emission Factor Documentation ... basically states that practices of combining and controlling specific exhaust stream from various operations within the hullers and shellers vary considerably among facilities. They also state that out of approximately 350 almond huller/shellers, no two are alike.

...A poor emission factor means that the test data is average or below average with reason to suspect that facilities tested did not represent a random sample of the industry. There also may be evidence of variability within the source category population.

Another important point is the variation in reporting the processing rate. Early emission factors were based on pounds particulate per field weight ton. Field weight includes nuts plus orchard debris, including leaves, twigs, soil and stones, which varies among facilities. Later results were obtained by using tons of finished almonds. Plus, no reliable direct PM-10 measured data (Method 201 or 201A) were found for the almond processing industry. They actually calculated PM-10 emission based on particle size distribution data."

We appreciate the opportunity to respond to this report and want to thank you for your cooperation. Please contact me directly if you have any questions, or if I can be of further assistance.

Sincerely,

Russell E. Barker

REB:rma

PEANUT BUTTER AND NUT PROCESSORS ASSOCIATION

COPY to MRI on 2-7-94

9005 Congressional Court
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Fax: (301) 365-7705

RUSSELL E. BARKER
Managing Director
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JAMES E. MACK, CAE
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January 24, 1994

Mr. Dallas W. Safriet
Environmental Engineer
Emission Inventory Branch (MD-14)
Office of Air Quality Planning
and Standards
United States Environmental
Protection Agency
Research Triangle Park, NC 27711

Dear Mr. Safriet:

Thank you for the fine cooperation you have provided regarding the reports you have developed in draft form, "Section 6.10.2, Salted and Roasted Nuts and Seeds" which will be published as a supplement to *Compilation of Air Pollutant Emission Factors*. Especially we appreciate your making available a sufficient number of the documents so that each Active member company might have the opportunity to review it. Interestingly and somewhat surprisingly, to date we have received only minimal reaction which suggests that the members are not disturbed by it. At the business meeting of Active member company Official Representatives at the annual convention last week, the subject was discussed. Again, the reaction was most restrained. Some of the members of this Association are very small companies and do not have technical personnel to make an evaluation. Quoted below is the text of one of the responses received.

> "In reference to the Air Pollutant Emission Factor report issued to Dallas W. Safriet, we cannot confirm or dispute the data as presented. We do not totally understand why this study was conducted. We assume it will simply be used as a data base to evaluate total environmental loads. We do not have any comments on this particular report at this time."

It is believed that the foregoing is generally representative of the thinking in the industry at this time. As of now we have not received any adverse comment. During the next few weeks I will be traveling, however my associate, Russell Barker who is Managing Director of the Association, will write you in further regard to the matter, although I suspect it is likely that it will be a reaffirmation of the content of this letter.

Sincerely,

James E. Mack

JEM:rma

NATIONAL PEANUT COUNCIL, INC.

1500 King Street • Suite 301 • Alexandria, VA 22314-2737
(703) 838-9500 • FAX: (703) 838-9089 • Telex: 440497 NPC DC

Quality ★USA★

copy to MRI on 2-7-94

January 13, 1994

Mr. Dallas Safriet (MD-14)
Emission Factor and Methodologies
U.S. Environmental Protection Agency
Office of Air Quality Planning and Standards
Emission Inventory Branch
Research Triangle Park, NC 27711

Dear Mr. Safriet,

Enclosed you will find letters of comment on the MRI Report "Emission Factor Documentation for AP-42, Section 6.10.2".

These are in response to a call for volunteers at a recent meeting of the National Peanut Council's Peanut Handling Committee.

As you will see, there are some concerns and corrections made by these committee members.

If we can be of any further assistance, please don't hesitate to call.

Sincerely,

H. Keith Adams
Director of Industry Services

ANDERSON'S PEANUTS
A Division Of Ala. Farmers Coop., Inc.
DIVISION OFFICE
P.O. DRAWER 420, OPP, ALABAMA 36467

12-17-93

Mr. H. Keith Adams
Director of Industry Services
National Peanut Council
1500 King Street
Suite 301
Alexandria, Va. 22314-2737

Dear Keith,

This letter is a follow-up to phone conversation we had on Tuesday, December 14th regarding the MRI report Emission Factor Documentation for AP-42, Section 6.10.2, Salted and Roasted Nuts and Seeds, Draft Report (Revision 3).

In reviewing this report especially the section dealing with the description of the peanut shelling industry there are no major points of disagreement. I do feel the writer could have used terminology that better describes our industry today.

The flow diagram (Figure 6.10.2.2-2) although simple in illustration does do an adequate job of identifying our industry PM emission points.

The statement on page 12 under Section 6.10.2.2.3 Emissions and Controls that says No information is currently available on emissions or emission control devices for the peanut processing industry is hard to believe since we have air permits for our plants today.

If you have questions or need additional assistance regarding this matter please let me or John Reed know.

Sincerely,
Anderson's Peanuts, A Div. of AFC

L. Joel Smith

c: John Reed- Anderson's Peanuts

Planters LifeSavers Company
Winston-Salem NC 27102
(919) 741-2000

Fax Cover Page

TO: Keith Adams

LOCATION: NPC

FAX NO.: 703-838-9089

FROM: Ed Holloway

DATE: 12/20/93

PAGES TO FOLLOW: 2

SENT FROM: 910-741-5706

SUBJECT/COMMENTS:

MRI Report Review

Planters LifeSavers Company

1100 Reynolds Blvd.
Winston-Salem, NC 27102

December 20, 1993

MRI Report Review

AP-42 is an industry guide to pollution emission factors for specific processes or operations. PLS uses AP-42 information when preparing permit applications for air pollution sources and emission control equipment.

Technical Merit

The report is intended to address air emissions from all operations associated with nut meat production. However, the document is based solely on limited and questionable quality air emission data from almond processing.

The general process descriptions presented in Section 2 are only partially representative of our plant operations. To provide our process descriptions would likely not gain us a competitive advantage, in fact, we might be giving away proprietary information.

Section 2.3 concerning emissions presents a hypothesis that roasting of almonds is a potential source of volatile organic compound (VOC) emissions. This assumption is carried over to peanut processing based on process similarities. The point to emphasize is that no chemical characterization data is available to identify what compounds could be emitted nor is there emission source test data available to quantify these potential emissions.

Section 3 presents data review procedures and EPA quality rating systems applied to the data and emission factors developed from the reviewed data. Based on the data quality rating system discussed in Section 3.2, data with a rating of less than A or B should not be utilized for determining emission factors. Ratings less than A or B represent tests based on untested or new methods and unacceptable methods. Emission factor quality ratings discussed in Section 3.3 specify the quality of the emission factors developed from analysis of test data. Ratings less than C appear to be of questionable value based on the quality of the test data, representativeness of the test sample pollution or variability within the emission sources.

Pollution emission factor development (Section 4) is based on only three (3) reports containing information suitable for development of particulate matter (PM) emission factors. These reports apparently identified the complex and variable air stream handling practices. The four cited references (from the three reports) contained data with a quality rating of C to D, with data from two references being cited as be not suitable for emission factor development. These ratings mean that the test data is based on either untested or unacceptable methods.

Emission factors developed for total PM were rated E (poor) by the EPA quality rating system. PM-10 emission factors were developed based on particle size distribution data rating of C to D since no reliable direct measured PM-10 data was found for review. The resulting PM-10 emission factor was rated E (poor).

MRI has recommended adopting PM and PM-10 emission factors based on the reviewed test data. The data quality is questionable as evaluated by EPA quality rating system. I disagree that the recommendation to adopt the proposed emission factors based on the poor quality ratings derived from the use of EPA's own rating system.

Policy Implications

The potential implications of this draft report being adopted as actual emission factors could include concerns such as the following:

- Potential need to conduct emission testing for PM and VOC's for peanut roasting operations to characterize and quantify actual emissions.
- Increased cost of nuts from suppliers based on tighter regulatory control of their operations.
- Potential need to permit emissions currently grandfathered (i.e. emission parts not currently required to have emission permits).
- Potential impact on peanut industry's public image as people learn that peanut processing potentially produces air pollution.
- High potential capital costs to install control equipment on roasting emission points if VOC emission testing indicates the need for such.

Based on our review of the draft report by MRI, PLS will work with the National Peanut Council and others in providing public comment on the proposed emission factors.

EH-1/asp

WILCO PEANUT CO.

P.O. DRAWER B • PLEASANTON, TEXAS 78064 • (210) 569-3808 • FAX (210) 569-2743

December 14, 1993

Mr. John Reed
Chairman, Peanut Handling Committee of
The National Peanut Council

FAX 205-493-7767

Dear John,

I have read the section of the MRI report Emission Factor Documentation for AP-42, Section 6.10.2, Salted and Roasted Nuts and Seeds, Draft Report (Revision 3) dealing with shelling of peanuts. This description of shelling is found on page 9, paragraph 2.2.1.3 Shelling -.

The flow diagram (Figure 2-2.) is on page 10. In order to more accurately reflect the terminology used in the industry today, I would suggest that the center block [Roll Crushing] be titled [Shelling]. I don't believe any of the rest of the flow diagram needs to be changed.

The second paragraph could more accurately describe normal processing practice if the first two sentences were deleted. The third sentence could be modified to read "A horizontal drum with a perforated and ridged bottom and rotating beater is used to shell peanuts."

The third paragraph, last two sentences, could be modified to read "The sized and graded peanuts are bagged or boxed for shipment or shipped in bulk hopper cars or trailers to end users, such as peanut butter plants and nut roasters."

If you would like me to work further on this or visit with other members of the committee, please let me know.

Sincerely,
WILCO PEANUT CO.

Byron Warnken

peanuts for reuse. The nuts are then dried and powdered with talc or kaolin to whiten the shells. Excess talc/kaolin is shaken from the peanut shells.

2.2.1.3 Shelling—

A typical shelled peanut processing flow diagram is shown in Figure 2-2. Shelling begins with separating the foreign material using a series of screens, blowers, and magnets. The cleaned peanuts are then sized using screens (size graders) to separate desired sizes. Sizing is required so that peanut pods can be crushed without also crushing the peanut kernels.

Next, the shells of the sized peanuts are typically crushed by passing the peanuts between rollers that have been adjusted for peanut size. The gap between rollers must be narrow enough to crack the peanut hulls, but wide enough to prevent damage to the kernels. A horizontal drum with a perforated and ridged bottom and rotating beater is also used to hull peanuts. The rotating beater crushes the peanuts against the bottom ridges pushing both the shells and peanuts through the perforations. The beater is adjusted for different sizes of peanuts to avoid damaging the peanut kernels. Shells are aspirated from the peanut kernels as they fall from the drum. The crushed shells and peanut kernels are then separated using oscillating shaker screens and air separators. The separation process also removes undersized kernels and split kernels.

Following crushing and hull/kernel separation, peanut kernels are sized and graded. Sizing and grading can be done by hand, but most mills use screens to size kernels and electric eye sorters for grading. Electric eye sorters detect discoloration and separate peanuts by color grades. The sized and graded peanuts are bagged in 45.4-kg (100-lb) bags for shipment to end users, such as peanut butter plants and nut roasters. Some peanuts are shipped in bulk in rail hopper cars.

2.2.1.4 Roasting—

Roasting imparts the typical "peanut" flavor many people associate with peanuts. During roasting, amino acids and carbohydrates react to produce tetrahydrofuran derivatives. Roasting also further dries the peanuts and causes them to turn brown as a result of peanut oil staining the peanut cell walls. Following roasting, peanuts are prepared for packaging or for further processing into candies or peanut butter.

There are two primary methods for roasting peanuts: dry roasting and oil roasting.

Dry roasting—Dry roasting is done on either a batch or continuous basis. Batch roasters offer the advantage of adjusting for differences in moisture content of different peanut lots from storage. Batch roasters are typically natural gas-fired, revolving ovens (drum-shaped). The rotation of the oven continuously stirs the peanuts to produce an even roast. Oven temperatures are approximately

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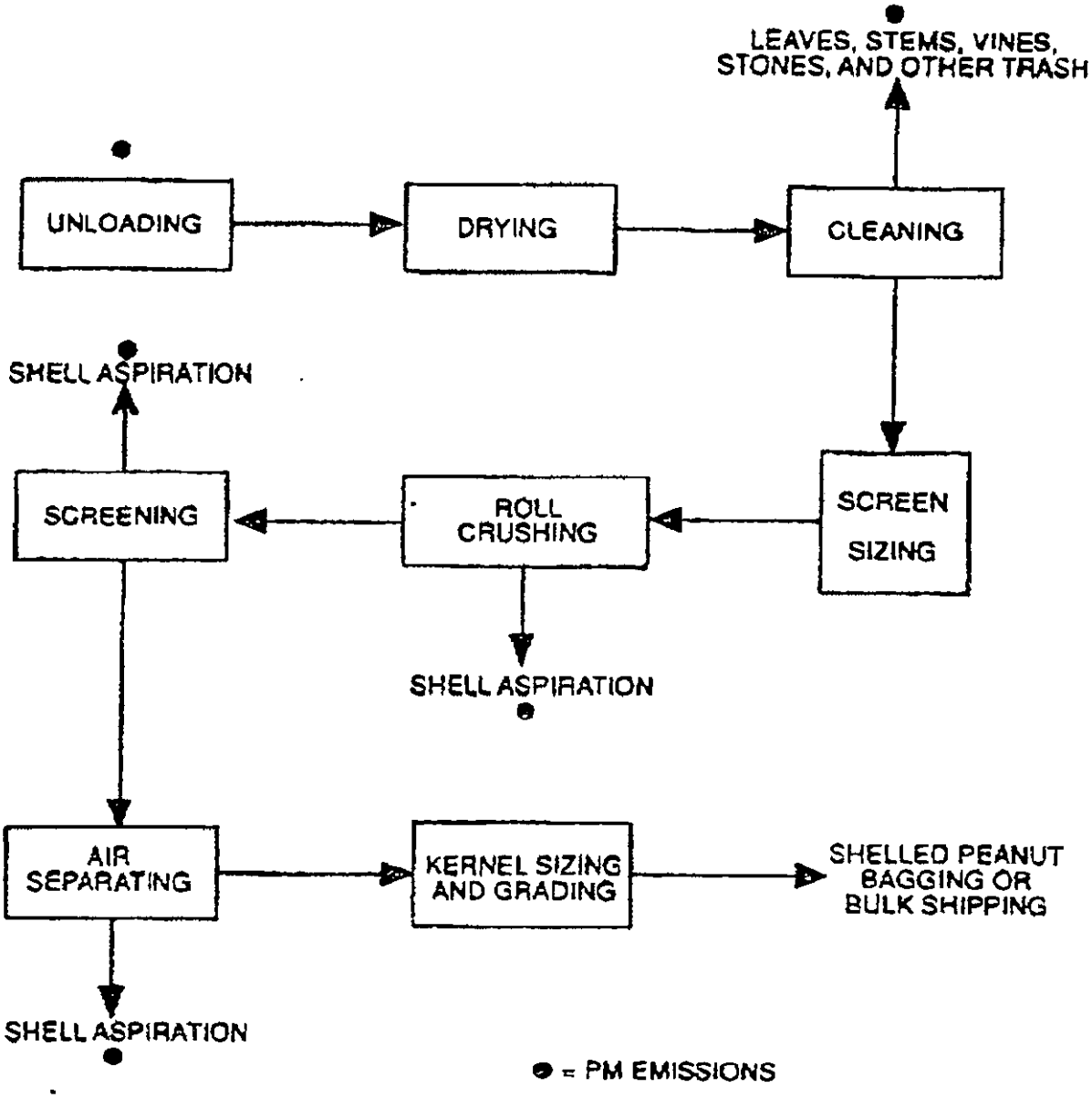


Figure 2-2. Typical shelled peanut processing flow diagram.

To: Dallas Safriet
EPA
919.541.0684

ECKLEY ENGINEERING
205 North Fulton Street
Fresno, California 93701
Phone (209) 233-1217 FAX 209.233.5756

July 7, 1993

MEMO

After talking with you this morning, I called Jim Ryals.

He informed me that you had told him that EPA had no interest in almond hulling and had no intention of using the AP-42 revision at all; therefore, you didn't care whether the information was accurate or not.

His explanation (attributed to you) was that since virtually all almonds were grown in one state, the federal regulators weren't interested in getting involved, but would rely on California to police itself.

He also told me the people he had appointed to study the draft. After hearing the names, I wish to repeat that our office has no interest in being part of careless or fraudulent work.

I am sending part of the critique I wrote two weeks ago. It is only a small fraction of what I had hoped EPA would want. We have developed emissions factors for varying types of shellers and hullers that have been used in California for permitting modifications and new construction, and for ERC applications.

The only way meaningful numbers can be provided is by producing pounds emissions per tons processed. There is too much to explain on how to develop these factors for this industry to try forcing the information on anyone who is not interested.

If you are not just "checking off an assignment" (as Jim Ryals said), I will be happy to share the test data, calculations, and other pertinent information.

wke

2.2.2
It does not appear to me that any distinction between hulling and shelling is made. Some facilities remove just the hull and sell in-shell almonds; other facilities remove the hull and shell and sell meats. In turn, the hulls are sold, often for the manufacture of cattle and horse food; the shells may be sold to co-generation plants for fuel.

In 2.2.2.2 (After the almonds are hulled, they are ready for further processing (roasting and salting) or raw consumption) the implication is clear that roasting and salting are performed in the shell or that we all consume the shells, roasted or raw. Pistachio's are, in fact, roasted and salted without shelling, but NOT almonds.

In Figure 2.1 I do not see anywhere the shell is discussed. I am inclined to think that the authors do not realize that the meat is covered by a shell, and the shell is covered by a hull.

Let's skip to Refernce 9 under 4.1. I provided the flow diagram of the Kerman facility (*EE Drawing D475A*) and discussed it with MRI people. They quoted from it in this draft (2-10), proving that they have it.

Under 2.4, the cyclone emission of 0.1 gr/dscf is true of some of the cyclone collector data we sent MRI. The range from 18 cyclones in four counties and seven facilities was from 0.0019 to 0.6729 gr/dscf. The pounds/field-weight ton processed PER SYSTEM (which is NOT the same as an emission factor per ton processed) was, in pre-cleaner cyclones from 0.152 to 1.388. In huller/sheller cyclone systems the range was from 4.120 to 0.085 pounds per meat ton processed. But I don't think any of the MRI people understand that those figures alone do NOT tell anything about the total emissions per ton.

To develop that emission factor, a flow diagram of each facility is needed. The airflows through EACH emission point have to be calculated along with the process rate and the grain loading. A facility may have multiple cyclones, a baghouse, and a multitude of airlegs venting to atmosphere. I provided MRI with the spreadsheet of testing we performed on seven airlegs at a Butte County facility. The range in pounds/hour emitted was from 0.0396 to 0.2859; in gr/dscf the range was 0.00079 to 0.2442.

I have calculated complete facilities' emissions and emission factors, but recall sending only one to MRI.

The sentence that starts "For high flow rates..." is misleading and wrong. It is excerpted from the 1974 CARB report and is totally non-sensical in terms of engineering. It is based on a "theory" that has

long since been discredited. Don't lend credence to a myth by perpetuating it, please. A properly designed, fabricated, and operated control device can be extremely efficient. High flow rates are not a factor.

Under 2.3, I have no idea why the statements are made as they are. We tested for metals and both total and crystalline silica. I have the certified lab reports for thirteen samples and the emissions factors as submitted to CARB and to all concerned APCD's for AB-2588 reporting. I don't recognize "small" as a scientific term, but the substances and their values follow:

Air Toxic	Pounds of toxic/pound of emissions
Arsenic	$2x10^{-6}$
Beryllium	$2x10^{-7}$
Cadmium	$3x10^{-6}$
Copper	$1x10^{-4}$
Lead	$4x10^{-5}$
Manganese	$5x10^{-4}$
Mercury	$5x10^{-11}$
Nickel	$3x10^{-5}$
Crystalline Silica	$7x10^{-3}$

Of the metals, only Cu, Pb, Mn, and Ni were found in all samples.

"The source of these metals....." is an irresponsible sentence. There are many sources besides the soil - fertilizers, sprays, elements picked up through the tree roots from both soil and water. Botanists realize that each plant has a propensity for certain substances. That is why planting oleanders around selenium-laden ponding basins has been considered. Cotton plants "attract" (to be facetious in word choice) arsenic, and so on.

The second sentence in 2.3 isn't true either. There are uncontrolled emission points in some almond facilties, just as there are in some cotton gins.

The last sentence in 2.4 is the type of irresponsible writing that makes me wonder why I care about helping. In the CCAGA test cited, the three runs showed PM_{10} to be 47%, 100%, and 21%. In the Particle Measurement Technology data in which a microprocessor controlled sonic siever was used to separate and collect the sample fractions from one of our airleg tests, only 0.4% of the sample was less than 10 microns and 3.1% fell into the range between 10 and 20 microns. It has been known (and published) for years that even baghouse emissions are NOT all PM_{10}, but one still finds statements like the "it might be expected" one in 2.4. I am always tempted to ask: "By whom?"

If the MRI people can't grasp the concepts involved, how can you possibly publish meaningful numbers? If nobody in MRI or EPA realizes that the nutmeat is surrounded by a shell and the shell is encased in a hull, how can they even begin to write about almond hulling/shelling? If there is no understanding that there must be a units emissions/units processed (e.g. pounds/meats-ton, pounds/bale) to discuss the subject sanely, how can you even generate meaningful AP-42's?

Somebody has to understand the process - no matter whether that process in in hullers or gins or anything else. The two most blatant flaws in the cotton gin AP-42 are so obvious that fifth-graders could spot them with only a few sentences explanation - one is a misprint and one is just utter nonsense. And yet, the gin numbers have been used for years with all of the conflicting data being almost universally ignored.

GIGO may be used for computers, but it applies equally to human minds. Can't we at least correct the most obvious errors? We've spent several years digging out material; analyzing source tests and publications; and performing research, testing, and modifications. We have documented information galore, especially on gins and hullers.

Even if Jim Ryals quoted you correctly, and EPA has no interest in a process that is limited to California, that is not justification for knowingly publishing an inaccurate document that will be used to determine whether facilities survive. Under current legislation, a facility must provide offsets in order to perform modifications that increase emissions. The cheapest way is to clean-up existing emissions enough to allow the increase. But because of the demand for meats (rather than in-shell product), many hullers are having to add shelling lines or to go out of business. AP-42's have enough influence that a carelessly written one could, in fact, cause decisions to be made that cause companies to fold.

After talking at length with involved people today and learning that they are planning to invite you to California to observe hulling, shelling, and processing operations, I would like to offer to make our records available to you. We have collected data from many sources, established the pooled source test and reporting figures for AB-2588, performed two major surveys and extensive testing, reduced the data, and worked with the regulatory agencies in permitting and air toxics recording. We also have designed equipment for a number of ag related fields. Our drawing and disk package of plans and specifications for 1D-3D cyclone collectors with low turbulence inlet transitions we make available to anyone throughout the country at no charge (although, since requests are becoming more frequent, I plan to ask a small fee to cover postage and printing). Since we don't sell any equipment, nor do we accept any percentage from manufacturers (as most engineers and architects do), we are not reimbursed for any of this educational work with regulatory agencies.

Let me make one more effort to communicate with you. If it is true, as Jim Ryals insists you told him, that you really don't care what you publish because almond hulling is limited to one state, then admit it. If his statement is not true, then try to understand the process.

You must be made aware that the process rate is normally an estimate given to the source testing technicians, whether or not it is published in the lab report. The source testing company takes no responsibility for its accuracy. On our CCAGA test we recorded the actual weights at unloading; therefore, the field weight processed is accurate. One of the most common ways to change the emission factors is to use inaccurate process rates/weights.

Without a flow diagram of a facility, there is no way to develop an emissions factor. All emissions points must be accounted for. On the 1974 CARB tests we have no way of knowing how many cyclones were in each pre-cleaner system, for example. The information is only given per cyclone. We also have no knowledge of other emissions points, such as airlegs. Look at the Butte Co. flow chart: it has one cyclone for the pre-cleaner, one from the huller, and one serving both. It also has seven airlegs from the huller, six of which vent directly to atmosphere.

Now look at items 1023, 1028, 1031, 3014, and 3022 on the two cyclone print-out sheets from the testing we did last fall. Those systems have from three to ten cyclones each. If a source test by the CARB approved testing lab had been performed, the data would have been printed as gr/dscf, pounds/hour, and, IF the management gave the lab process numbers (right or wrong), as pounds/ton processed.

BUT THE POUNDS/TON PROCESSED WOULD APPLY TO ONLY ONE CYCLONE! If the only emissions point in that pre-cleaner were one cyclone, the number could reflect emissions. If there were multiple cyclones on a splitter serving that pre-cleaner, the number would be wrong. By the same token, the labs are printing "pound/bale" figures for cotton gins BUT WITH RESPECT TO ONLY ONE OF MULTIPLE CYCLONES ON A SPLITTER. The unsophisticated engineer writing permits for an air district, assumes "pounds/bale" means pounds/bale. The practice is misleading at best.

With respect to flow rate, there is even more confusion. Roughly five tons must run through a pre-cleaner to produce one ton of meats. That means that to generate a pounds/meat-ton emissions factor, five times the pre-cleaner factor must be added to the huller-sheller factor. But only about 70% of the material coming into a plant enters the huller and only about 30% enters the sheller. Because there is no way to weigh the intermediate process, it is necessary to calculate from both ends towards the middle to develop an emissions factor. We can determine field-weight; we can determine end-product weight (whether it is in-shell or meats). I have developed a series of equations to make these calculations easier and given them to interested air quality engineers.

ALMOND HULLERS
and
PROCESSORS
ASSOCIATION

3900 Braeburn Drive
Bakersfield, CA 93306
(805) 871-2515
FAX (805) 872-3830

Received 7/19/93
RMN

July 7, 1993

Mr. Dallas W. Safriet
Emission Inventory Branch
Office of Air Quality Planning and Standards
Research Triangle Park, NC 27711

Dear Mr. Safriet,

Thank you for allowing the Almond Hullers and Processors Association the opportunity to comment on the draft of the almond section of AP-42, section 6.10.2.

I will key my comments to specific page # and paragraphs when possible. I have also included a marked up flow diagram and some other diagrams that may be useful in describing our business.

Page 1-1 and following - the question was repeatedly asked among our members, "Why in the world are they talking about peanuts in the almond section?"

Delete form section 2 all references to peanuts. It detracts from the purpose of the section.

Page 2-3 - Paragraph 2.1.2. The last line of first paragraph. <u>All</u> almonds of any commercial significance are grown in California. There is a federal marketing order that covers almonds.

Page 2-8 - Paragraph 2.2.2. The first sentence should read, "Almond processing facilities consist of <u>four</u> basic operations: harvesting, hulling, shelling and processing. Roasting is an important, but relatively minor part of the processing of almonds.

Page 2-8 Paragraph 2.2.2.1 It states that 25% of the material in the rows may be..... Our long term averages indicate that this is 12 - 14%, not 25 % as stated.

Page 2-8 Paragraph 2.2.2.2 Suggested last sentences follow. After the almonds are hulled and shelled, they are ready for further processing (grading, roasting, blanching, dicing, slicing; etc).... Almond hulls are marketed as a dairy feed and the shell of the almond is a primary fuel for bio-mass fired co-generation plants.

Suggested changes to page 2-9 are included as an enclosure.

Page 2-10 - paragraph titled Separating and Shelling. Cracked almonds..... which separate hulls from the almond meats. 4th sentence - The screen separates the unshelled.....

Page 2-10, paragraph titled Final Processing. The first sentence needs to include blanching and dicing to be complete. Roasting and salting are fairly minor in comparison to the raw product sales.

Page 2-11, paragraph beginning "Metals on the Clean Air Act....." The California Air Resources Board has a mountain of true data on what is and is not in the hulling process. You should be able to obtain this by referring to the AB 2588 test for toxic hot spots. This would eliminate guess work and the use of words like may and is believed.

The statements in the next paragraph are also of concern. We are trying to deal with PM 10 not " all fugitive emissions". The use of words like "roughly estimated" at the 10% level make us nervous. The next time we see rules being written, they will reference AP-42 and use the 10% figure as gospel.

Page 2-11, Paragraph 2.4 - The last sentence of this paragraph is unsubstantiated and should be omitted until scientific data is available. This is not even a SWAG at this time.

Page 4-1,Paragraph 4.1 - The descriptions in the second paragraph are interesting, but the only true statement that can be made is that we have approximately 350 hullers or huller/shellers and no two are alike. The statement about the two large bag houses would be a rarity according to the committee that reviewed this document.

Page 4-2, top of page. Field weights typically yield 13% debris, 50% hulls, 23% meat and 14% shells would be a more accurate statement.

Section 6.10. 2.

General - Please see previous comments. The process is four basic operations; harvesting, hulling, shelling, and processing. Don't get hung up on roasting. A relatively minor percentage of the crop goes through the roasting process.

Again, our members report that over many years the field debris is between 12- 14%, not the 25 % used in this and previous sections.

The use of the word loosen when discussing the screens is misleading. The screens serve to separate different sizes and direct the flow to hull, shell and meat destinations. Please see the flow diagrams provided as enclosure 2.

In the paragraph on metals, please refer back to my comments on the availability of information from California Air Resources Board on AB 2588 (Toxic Hot Spots).

The next to last paragraph on page 6.10.2-2 is risky. You talk about 0.1 grains and 0.001 grains which is fairly precise number. In the next sentence you talk about expectations which we do not have data to substantiate. It has been our experience that local regulators jump on these numbers as truths and things rapidly get out of hand. Please leave conjecture out of a formal document and we will work with you to get you as much factual, supportable data as we collect.

Pages 6.10.2-4 and 5. This page completely omits information on shelling. Shelling is as important as hulling.

The following comments were provided by an air engineer that we requested to review the document.

1. Remove the fourth paragraph on page 6.10.2-3. This paragraph suggests the possibility of metals and silica being emitted from the process. (Please see my previous comments on AB2588 data that should be available from CARB.)

2. Remove the fifth paragraph on page 6.10.2-2. This paragraph "roughly estimates" fugitive emissions from cyclones as 10% of the measured particulate. This is entirely speculation, without scientific data to back it up. Given a lack of other information, a permitting official could pick up on this as a fact.

3.Either remove or modify the tables 6.10.2-1 and 6.10.2-2 **CANDIDATE TOTAL PARTICULATE EMISSION FACTORS FOR ALMOND HULLING**.

This comment will be broken into two sections: emission points with cyclones and emission points with bag houses.

CYCLONES - These factors were developed using the 1974 test report performed and compiled by the California Air Resources Board (CARB). The factors were derived by determining the average of the source tests. This could be a big problem, because the first thing that would happen is that these factors would be used to specify an emission limit on a new or modified huller. If that in deed does happen, by definition 50% of the hullers would be in violation; since the data was based on average of source tests. However, a portion of the data used to determine the emission factors were from source test data that exceeded the particulate matter concentration limit of 0.1 g/dscf.

BAG HOUSES - This data was based on one source test. Again, one of the first things that could happen with this emission factor is that it will be used to set a standard for which all hullers with bag houses would have to meet. This is a very low emission factor. While bag houses may be extremely efficient for almond hullers, the error in source testing could be a problem. Especially since all of the source test mentioned in the MRI report (those test without bag tears) and others (Superior Farms, Central California Almond Hullers, Harris-Woolf) demonstrate an emission factor higher than specified. The concern with source testing is the error that is

present in the source test method. The error could play an important part in demonstrating compliance with this low of an emission factor with only one test being used. There is a question on its accuracy and its possible uses.

4. OVERALL - There is a definite need for emission factors. Recognized emission factors are invaluable. Recognized emission factors are the only avenue for reducing the amount of source testing that must be performed. Also, they play a major role in speeding up the permitting process at the local districts. I would suggest consulting bag house manufactures as to what they can guarantee as emission factors, within reasonable economic guidelines.

As a conclusion, I would request that serious consideration be given to delaying this section until a thorough search is made for source test data. The information at hand may lead to erroneous conclusions.

Unfortunately, farming requires dirt and dirt produces dust. Our job is to work together to set reasonable standards that will allow us to continue to feed people at a cost they can afford.

Please call if I may be of any assistance. I will work for cooperation to find the resources to obtain any data you may wish to gather.

Sincerely,

Jim Ryals

Jim Ryals
Manager

encl: 1. Suggested Page 2-9 and 6.10.2-3
2. Almond Product Plant Flow

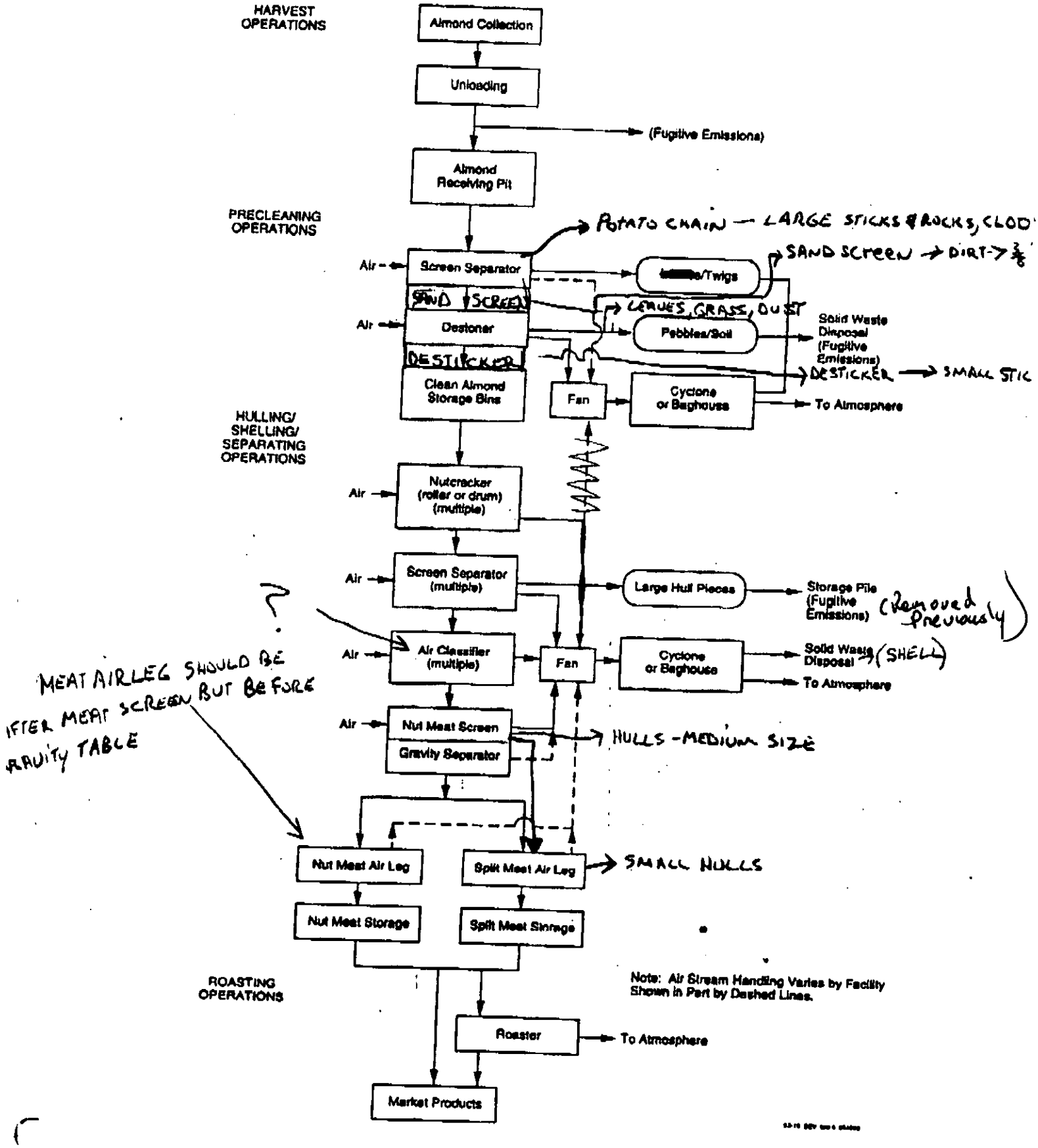


Figure 2-1. Representative almond processing flow diagram.

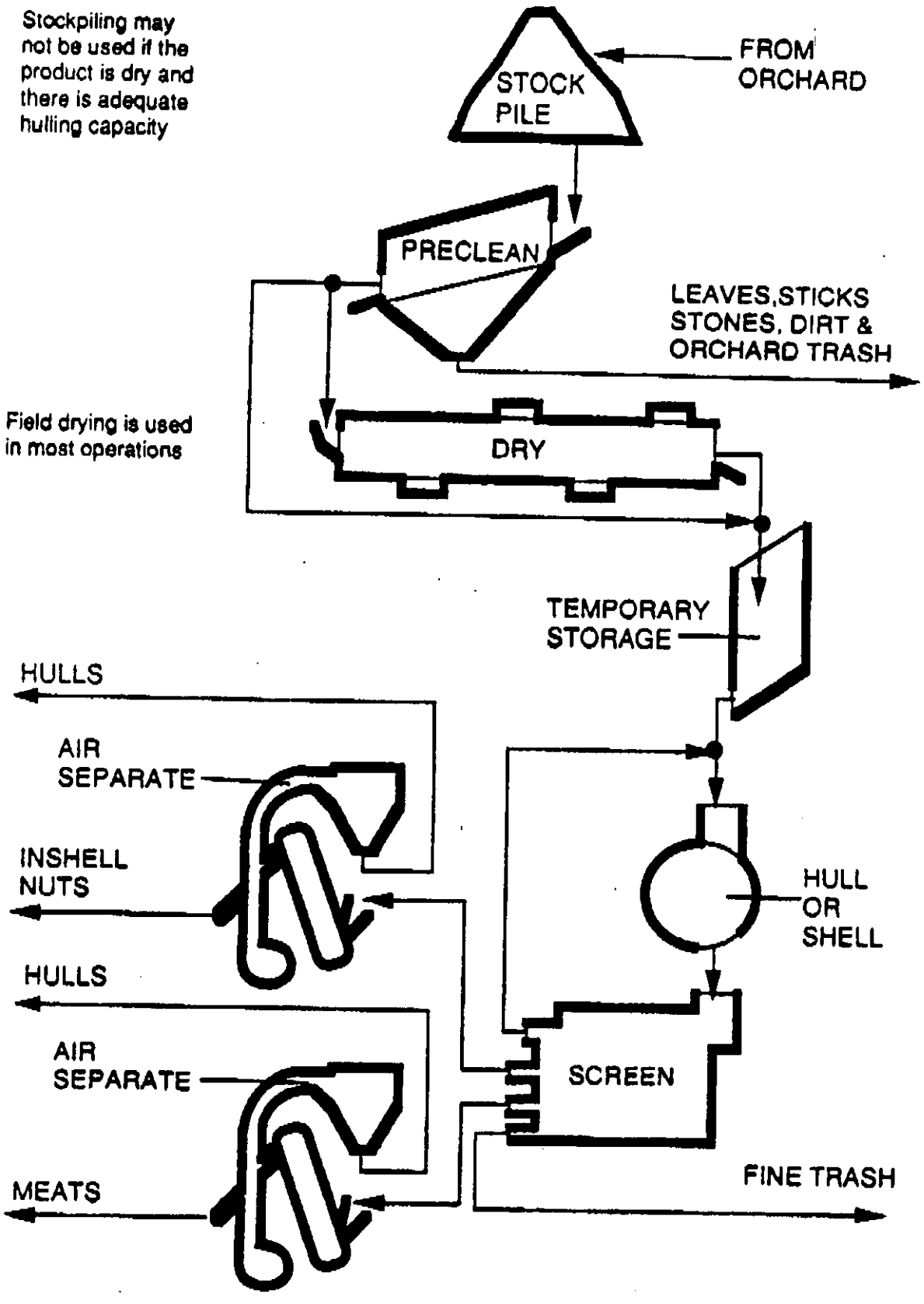


Figure 1. Flow diagram of a typical almond hulling operation.

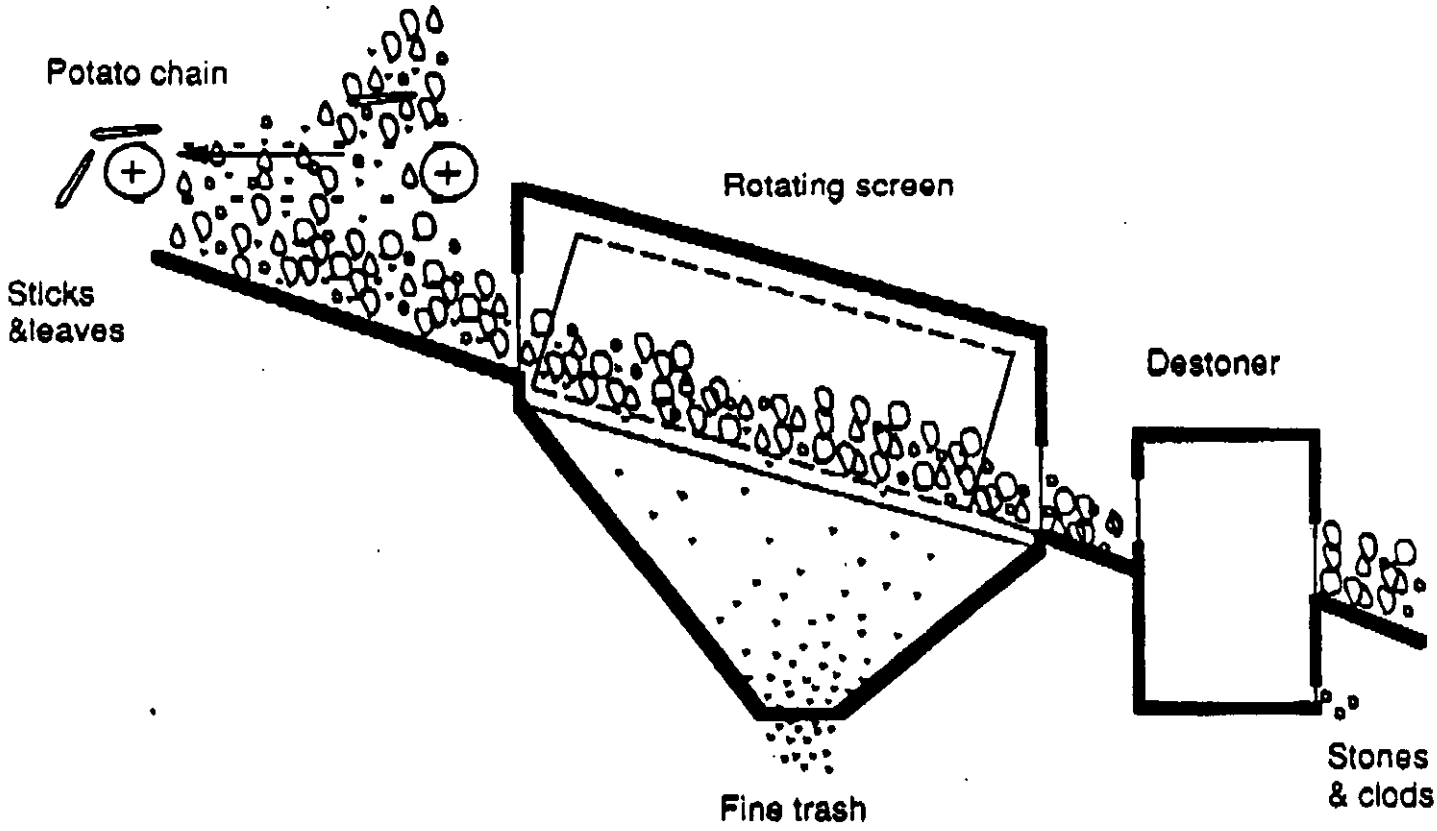


Figure 2. Precleaning system used to remove trash before hulling or drying.

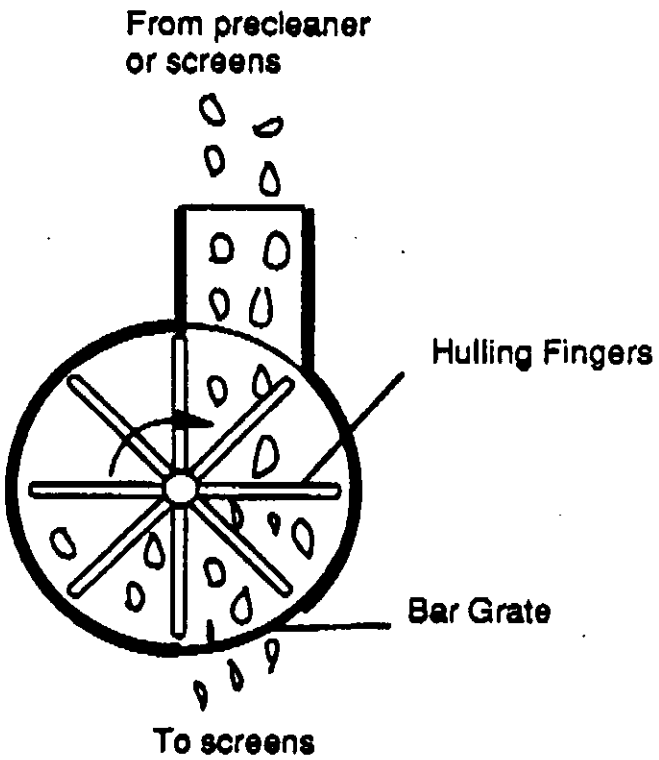


Figure 5. Hulling cylinder used to separate hulls from inshell almonds

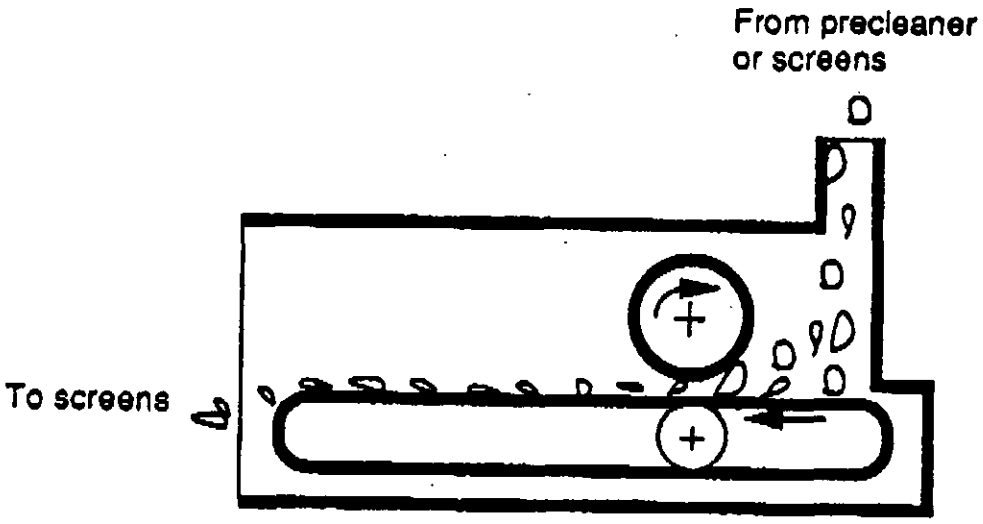


Figure 6. Shear roll used to hull almonds.

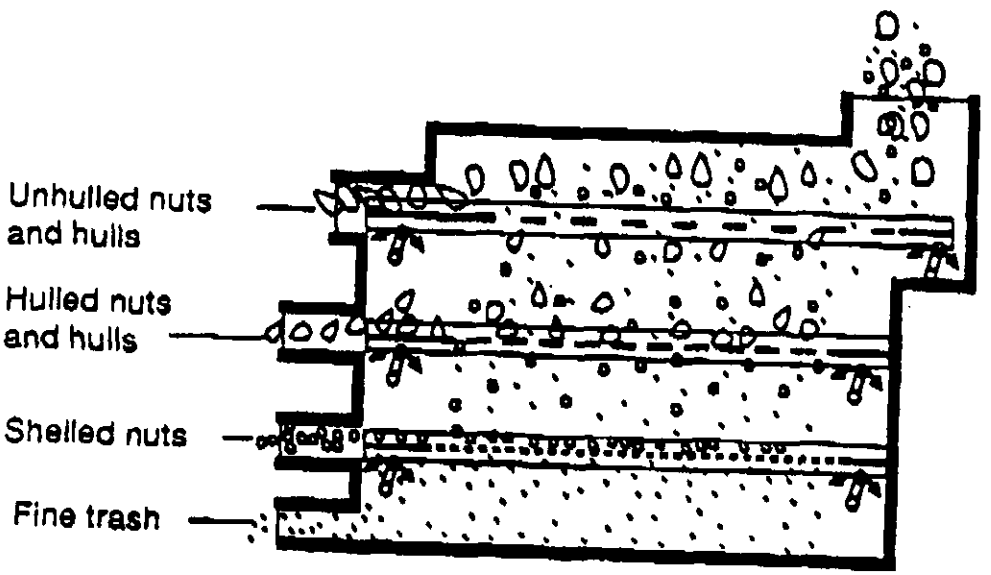


Figure 7. Classifying screen for separating products produced by hulling or shelling operations.

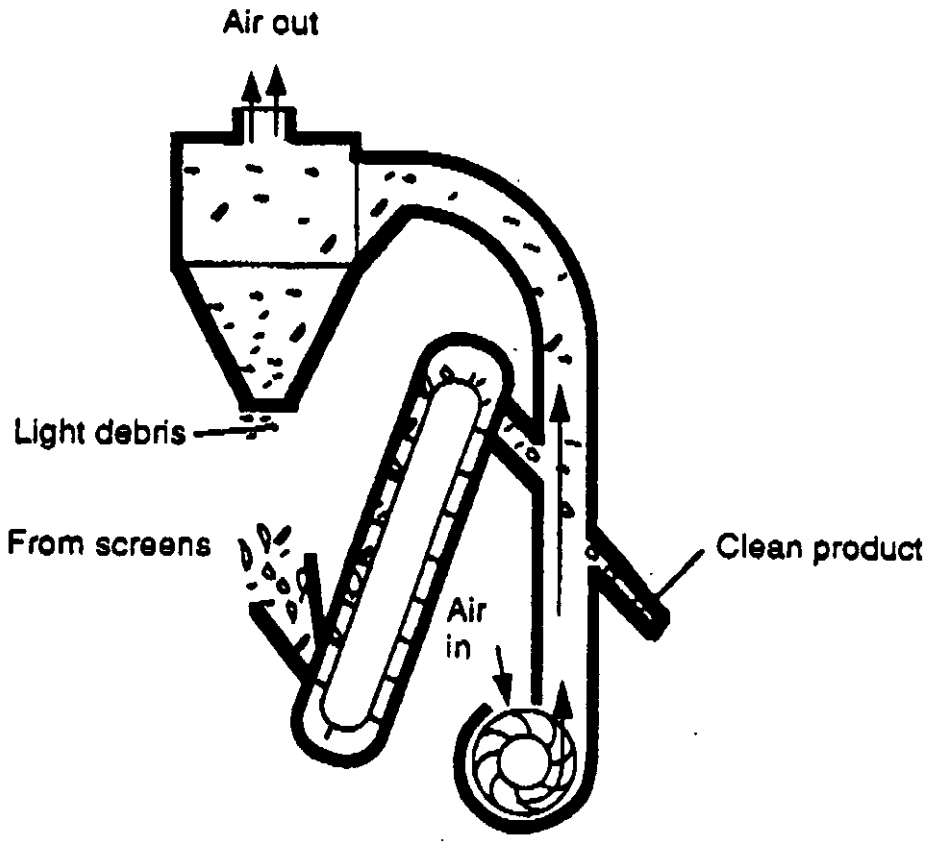


Figure 8. Air separator removes hulls or trash from inshell almonds or meats.

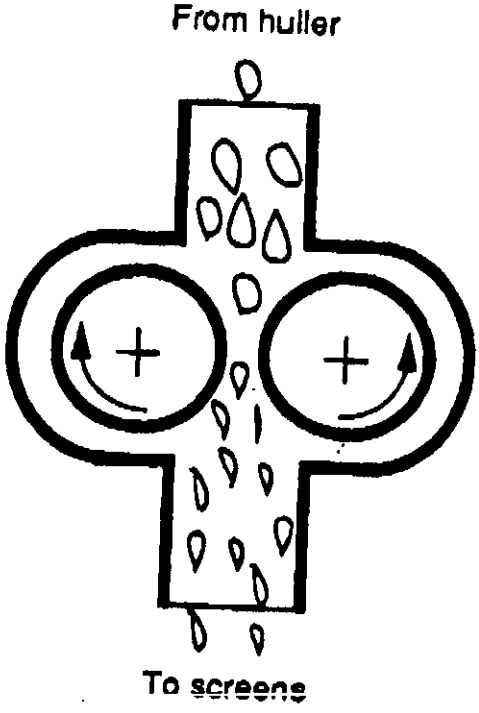


Figure 9. Cracking roll used to shell almonds.

Example of illustrated problem w/ interpreting source tests. The unsophisticated air quality engineer would assume a meaning not justified.

	Run #1	Run #2	Run #3	Average
Total Particulate				
gr/DSCF	0.0130	0.0124	0.0113	*0.0122*
lb/hr	0.45	0.43	0.39	*0.42*
lb/Bale	0.04	0.04	0.04	*0.04*
Particule Size Distribution				
+10µ (%)	57.08	62.74	73.10	*64.31*
+10µ (lb/hr)	0.26	0.27	0.29	*0.27*
+10µ (lb/Bale)	0.02	0.03	0.03	*0.03*
-10µ (%)	42.92	37.26	26.90	*35.69*
-10µ (lb/hr)	0.19	0.16	0.10	*0.15*
-10µ (lb/Bale)	0.02	0.01	0.01	*0.01*

Full facility (FF)
See bottom line

Calc sheet FF
Flow chart, raw data, etc. available

Est. airleq emissions

3 ea 48"

$$\frac{(3)(48)(12)(1200)}{144} = 14{,}400 \text{ cfm}$$

average gr/ft³ (from chart)

.00079
.00088
.00269
.00624
.00187
.00291

$\bar{x} = 0.00256$

$$\frac{(14{,}400)(0.003)(60)}{7000} = 0.37 \text{ lb TSP/hr}$$

50% conversion = 0.18 lb PM_{10}/hr

ave. process wt = 0.852 tons/hr

airleq emissions / ton = 0.21 lb/ton PM_{10}

Est cyclone emissions (50% conversion)

if 5 Tons feed wt → 1 ton meats

cyc # 3038	5(0.143) =	0.715	lb/ton meats PM_{10}
# 1051		0.278	
# 1058		0.203	

Total PM_{10} emissions / ton meats

0.21 + 0.715 + 0.278 + 0.203 = 1.4 lb.

Pre-Cleaner Cyclones

	SYSTEM		Gr/ DSCF	DSCFM	Cyl - Cone- ϕ Inches	Field tons/hr	TSP lb/hr	TSP lb/ton
# 3008	Leaf & Dust		0.6046	4436	80 - 80 - 40	18.44	25.59	1.388
			0.7147					
			0.6994					
		$\bar{X}$=	0.6729					
# 3014	Destoner		0.0146	4752	80 - 80 - 40	18.41	1.29	0.559
			0.0485				Note: 8 Cyclones	
		$\bar{X}$=	0.0316				10.30	
# 3022	Off-Pit		0.0374	2377	80 - 80 - 40	18.34	0.70	0.152
			0.0310				Note: 4 Cyclones	
		$\bar{X}$=	0.0342				2.79	
# 3028	Leaf Aspirator		0.0450	6229	59 - 50 - 39	11.67	2.61	0.224
			0.0461					
			0.0557					
		$\bar{X}$=	0.0489					
# 3032	Sand Screen		0.1269	4289	78 - 78 - 54	21.36	5.20	0.243
			0.2284					
			0.0690					
		$\bar{X}$=	0.1414					
# 3037	Destoner		0.0472	7355	48 - 117 - 88	13.20	2.41	0.183
			0.0323					
			0.0351					
		$\bar{X}$=	0.0382					
# 3038	Pit, Deleafer, & Destoner		0.0382	7186	120 - 130 - 60	7.16	2.05	0.286
			0.0282					
			0.0333					
		$\bar{X}$=	0.0332					

HULLER CYCLONES

	SYSTEM	Gr/DSCF	DSCFM	Cyl - Cone- ϕ	Meats tons/hr	TSP lb/hr	TSP lb/ton
# 1016	Gravity Table	0.0042	7079	60 - 60 - 44	2.89	0.1638	0.057
		0.0012					
		X̄= 0.0027					
# 1017	Shell Aspirator	0.0212	2388	72 - 72 - 34	1.96	0.4514	0.230
		0.0230					
		X̄= 0.0221					
# 1019	Huller Aspirator	0.0264	1626	72 - 72 - 34	2.89	0.3512	0.122
		0.0239					
		X̄= 0.0252					
# 1023	2 ~ 48" Airlegs	0.0030	5027	88 - 88 - 44	2.52	0.1293	0.154
		0.0031				Note: 3 Cyclones	
		X̄= 0.0030				0.3878	
# 1028	1 ~ 60" Meat Airleg	0.0055	2707	66 - 84 - 42	2.52	0.1114	0.133
		0.0042				Note: 3 Cyclones	
		X̄= 0.0048				0.3341	
# 1031	8 ~ Sheller Decks	0.0645	1767	68 - 69 - 26	2.52	1.0375	4.120
		0.0725				Note: 10 Cyclones	
		X̄= 0.0685				10.37	
# 1046	Decks	0.0016	6175	61 - 104 - 46	1.18	0.1006	0.085
		0.0018					
		0.0023					
		X̄= 0.0019					
# 1048	Shell	0.1320	3450	78 - 78 - 56	2.09	4.1016	1.960
		0.1430					
		0.1411					
		X̄= 0.1387					
# 1055	Huller	0.3641	2545	43 - 77 - 42	6.78	7.58	1.120
		0.3264			Note: In-shell tons		
		0.3517					
		X̄= 0.3474					
# 1057	Shear Rolls	0.0146	3328	68 - 80 - 72	0.852	0.4735	0.556
		0.0175					
		0.0178					
		X̄= 0.0166					
# 1058	Huller	0.0170	2842	68 - 80 - 64	0.852	0.3459	0.406
		0.0141					
		0.0114					
		X̄= 0.0142					

Sample Number	Emission Point	Run Number	Filter Wt Start (gm) (calibration weighing)	Filter Wt Stop (gm) (analytical weighing)	Filter gain (gm)	Run Time (min)	Sample Flow scfm	Sample grains/scf collected	Sample grains/scf collected	Grains/scf	lb/scf	System ACFM	System grains/hr	System pounds/hr	Destruction	Assumed % emitted	Pounds/hr emitted
(Replicate)																	
7	#2 Airlegs N	1	20.763	21.069	0.306	48	102.5	0.0064	0.09875	0.00096	0.00079	5852	277	0.0396	atmosphere	100	0.0396
11		2	21.209	21.405	0.198	48	102.5	0.0041	0.06326	0.00062							
4	#2 Airlegs S	1	20.622	21.019	0.397	48	106.8	0.0083	0.1276	0.00119	0.00088	6290	392	0.0494	atmosphere	100	0.0494
8		2	20.877	21.067	0.190	48	106.8	0.0040	0.0611	0.00057							
(No. 1 Finish)																	
6	E Airlegs S	1	20.951	21.838	0.887	48	120.4	0.01848	0.2851	0.00237	0.00269	6212	1003	0.1432	atmosphere	100	0.1432
4		2	21.101	22.227	1.126	48	120.4	0.02346	0.3620	0.00301							
1	E Airlegs N	1	21.278	23.730	2.452	60	89.4	0.0409	0.6306	0.00705	0.00624	5945	2001	0.2859	atmosphere	100	0.2859
2		2	20.914	22.421	1.507	48	89.4	0.0314	0.4844	0.00542							
9	Hash Airlegs S	1	21.233	21.984	0.751	60	116.8	0.0125	0.1931	0.00165	0.00187	4286	451	0.0689	hull house	100	0.0689
12		2	20.951	21.862	0.911	60	111.9	0.0162	0.2343	0.00209							
10	Hash Airlegs N	1	21.133	21.673	0.540	30	96.5	0.0180	0.2777	0.00288	0.00291	3700	646	0.0928	hull house	100	0.0928
13		2	21.068	21.620	0.552	30	96.5	0.0184	0.2839	0.00294							
5	Dryer	1	23.571	23.581	0.010	60	45.5	0.00017	0.00257	0.000056	0.000066	41,413	164	0.02346	atmosphere	100	0.02346
3		2	23.693	23.706	0.012	60	40.4	0.00020	0.00302	0.000075							
(Sander) (Dust)																	
15	500 Airlegs	1	23.269	66.276	43.007	18	186.6	2.389	36.862	0.1975	0.2442	2928	12,901	6.129	hull house	< 3.5/20	0.2145
16		2	21.420	42.524	21.104	6	186.6	3.517	54.267	0.2908							
														Σ 7 airlegs			0.8936

1992 Cyclone Collector Testing Program by County

STANISLAUS

Fraser Almond Farms
3530 Geer Road, Hughson 95326

Waterford Almond Huller & Sheller
12013 El Pomar Avenue, Waterford 95386

MERCED

Monte Cristo Packing Company
11173 W. Mercedes Ave., Livingston 95334

Swanson Hulling
19835 Fowler Road, Turlock 95380

MADERA

Minturn Huller Cooperative, Inc.
9080 S. Minturn Rd., Chowchilla 93610

BUTTE

Almont Orchards, Inc.
3108 Burdick Road, Chico 95928

Shasta Vista Almond Huller
4471 Nord Highway, Chico 95926

These are the flow diagrams I sent MR at the very beginning of our dialogue.

You will note that D475A represents a huller/sheller with all emissions thru' baghouses, whereas D455A shows a huller (whose end product is in-shell almonds rather than meats) with both airlegs and cyclones venting to atmosphere.

I chose these two to illustrate the range of equipment, both process & air pollution, and because we have valid source tests of all emissions points on both facilities along with accurate process weights.

From a survey we performed we have owner-generated flow charts of a large number of facilities.

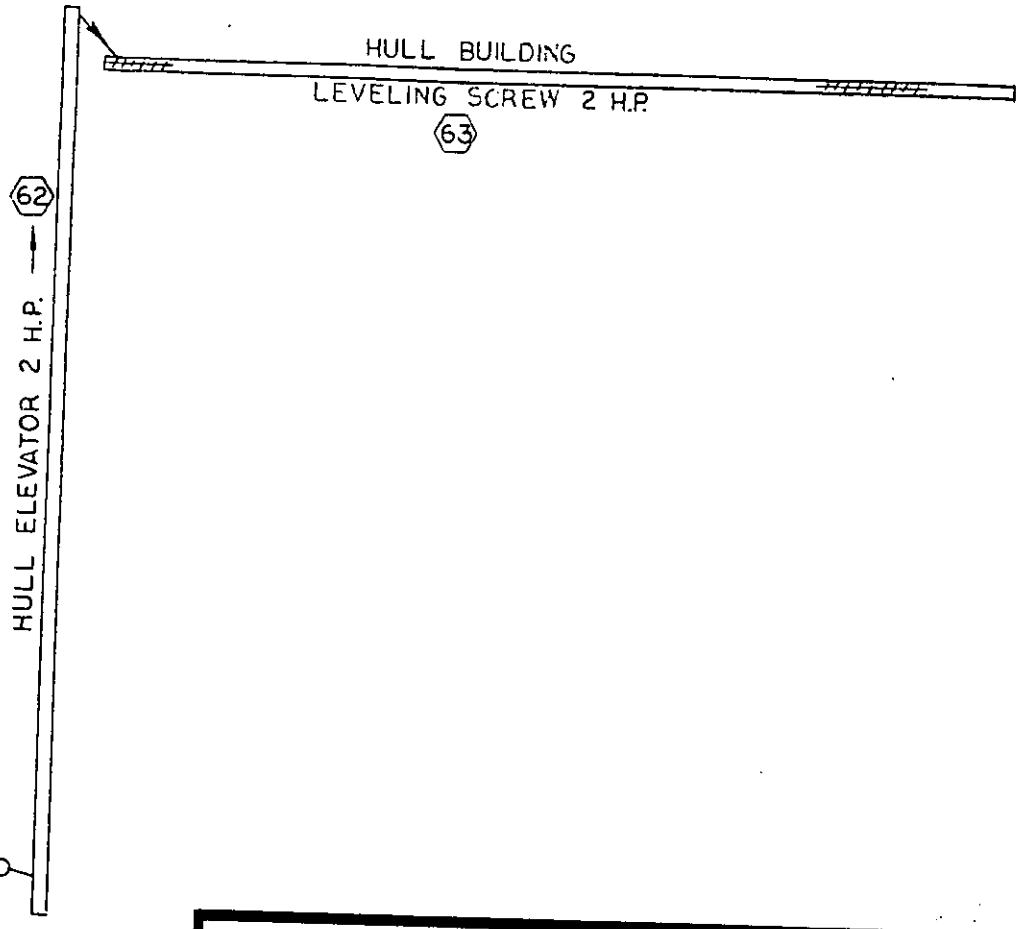
ECKLEY ENGINEERING

REGISTERED PROFESSIONAL ENGINEER ROBERT CLARK ECKLEY No. 15357 EXP. 12-31-92 MECHANICAL STATE OF CALIFORNIA

CENTRAL CA ALMOND GROWERS ASSN
KERMAN II
FLOW DIAGRAM

DRAWN BY MY	DATE 7-19-92	CHECKED BY	DATE
SCALE NONE	APPROVED BY		
SHEET 1 OF 1 SHEETS		DRAWING NUMBER D475	REV. A

Original Drawings @ MRI



ECKLEY ENGINEERING

REGISTERED PROFESSIONAL ENGINEER
ROBERT CLARK ECKLEY
No. 16337
Exp. 12/31/91
MECHANICAL
STATE OF CALIFORNIA

SHASTA VISTA ALMOND HULLER
1991 FLOW DIAGRAM

DRAWN BY MY	DATE 8-19-91	CHECKED BY	DATE
SCALE NONE	APPROVED BY		
SHEET 1 OF 1 SHEETS		DRAWING NUMBER D455	REV. A

Central California Almond Growers Association
10910 East McKinley
Sanger, California 93657
Phone (209) 251-1050 FAX 209.251.8642
July 9, 1993

Mr. Dallas W. Safriet, Environmental Engineer
USEPA
Emission Inventory Branch (MD-14)
Research Triangle Park, North Carolina 27711

Dear Mr. Safriet:

As you requested in our telephone conversation today, I have enclosed copies of the AP-42 draft we discussed. I have made some notes and a few comments which I feel are important if reporting is to be accurate. There are great variations in the type and arrangement of almond huller/shellers, from very small family operations that service only one orchard and operate less than two weeks a year to large operations which serve several counties and operate several months a year.

I feel communication between people in our industry and government regulators is the only way to achieve fair and accurate guidelines under which to work.

With reference to our source test information used in your AP-42 draft, we did, in fact, document production rates during the times of testing. Certified weigh tickets with printed times and weights are available; the registered professional engineer who wrote the test protocol and supervised testing can stamp the tickets, if you require further verification.

Enclosed also is a stamped and signed copy of the flow diagram of our tested facility.

I would be pleased to show you a variety of facilities in our San Joaquin Valley that demonstrate the range of activity in the hulling/shelling industry with respect both to processing methods and air pollution control methods if you could arrange to visit during our season which we anticipate will begin in mid-August this year.

I look forward to meeting with you in person.

Sincerely,

Darin Lundquist
Manager

prevent charring of the peanuts on the bottom. Oil is constantly monitored for quality and frequent filtration, neutralization, and replacement is necessary to maintain quality. Coconut oil is preferred, but other oils such as peanut and cottonseed are frequently used.

Cooling also follows oil roasting so that a uniform roast can be achieved. Cooling is achieved by blowing large quantities of air over the peanuts on either conveyors or in cooling boxes.

2.2.2 Almond Harvesting and Processing

Almond processing facilities consist of ~~three~~ FIVE basic operations: harvesting, hulling Shelling ~~hulling~~ and processing, and roasting. Each is described below. Major steps are included in the process flow diagram, Figure 2-1, although differences exist between operators in nut processing and in air pollution control practices and equipment.

2.2.2.1 Almond Harvesting—

The almond harvest and process season runs from 2 to 4 months and usually starts in August. The beginning and the length of the season varies with the weather and the size of the crop.

Almonds are harvested either by knocking the nuts from each limb with a long pole or by mechanically shaking them from the tree. The almonds are swept into rows. Mechanical pickers gather the contents of the rows and load them into special trailers for transport to the almond huller. Approximately 25% of the material in the rows may be orchard debris, such as leaves, grass, twigs, pebbles, and soil.

2.2.2.2 Almond Hulling and ~~Processing~~ Shelling

Almond processing is part of the Salted and Roasted Nuts and Seeds industry (SIC 2068). Almond hulling is the part of almond processing in which almonds are cleaned and the ~~almond nut meat is separated from the hull~~. After the almonds are hulled/shelled ~~hulled~~, they are ready for further processing (roasting and salting) or raw consumption. Waste almond hulls are used in a variety of products as an abrasive. almond shell is used for co-generation fuel.

Inshell almonds are removed from the hull. Almond meats are then removed from the shell. (over) →

Some facilities produce In-shell almonds only.

Some facilities produce In-shell almonds first, then from the inshell produce meats.

Some facilities produce almond meats in one process removing & separating hull & shell simultaneously and separating all products.

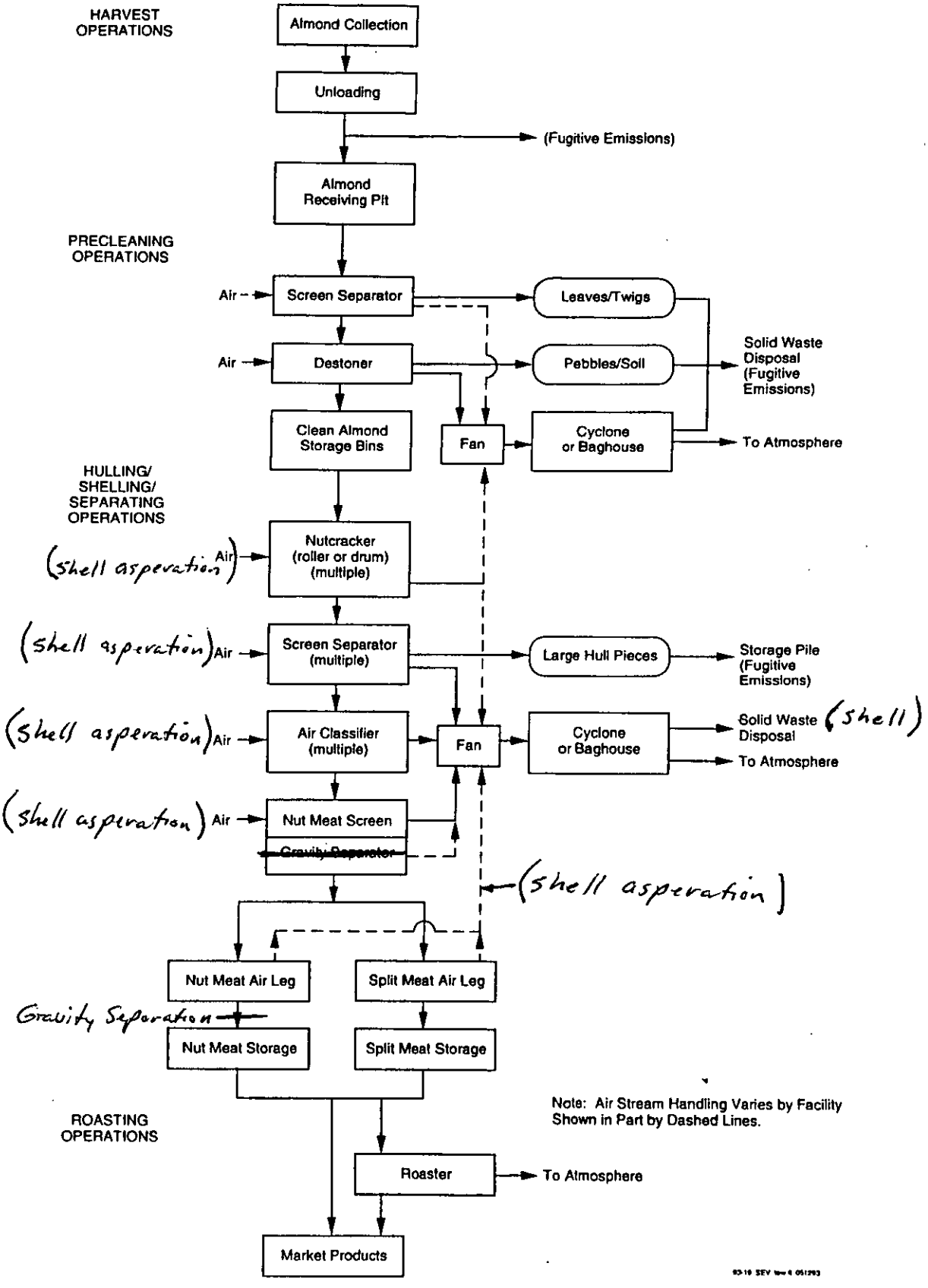


Figure 2-1. Representative almond processing flow diagram.

Precleaning—Almonds arrive at the almond hulling facility via trailers from the orchards. The almonds are loaded into a receiving hopper or trench, and transferred to a set of vibrating screens. The screens remove the orchard debris (leaves, soil, pebbles, etc.). The unhulled almonds then are conveyed to destoning units which remove stones and other larger debris. Particulate matter in the air stream from the destoning units is removed by a cyclone or a baghouse for disposal. The precleaned almonds are then stored in storage bins for further processing.

Hulling—Almonds are conveyed from the in-process storage bins on belt and bucket conveyors to sheer rollers or tined drums which crack the almond hulls. The cracked almonds are then discharged to the separating section.

Separating or Shelling—Cracked almonds are passed through a series of vibrating screens which loosen and separate hulls from the almond meat. The separating section may consist of one or more screens. The number of passes and the combinations of equipment vary from facility to facility. The screen shakes the unshelled almonds loose from their hulls and the nut meats fall to a vibrating conveyor. The remaining unhulled almonds pass through additional sheer rolls or tined drums and screen separators.

The hulled/shelled almonds (meats) and small hull pieces are conveyed on vibrating conveyor belts and bucket elevators to an air classifier that separates hull pieces from the meat. The almond meats then typically move through a series of gravity separators which sort meats by lights, middlings, goods, and heavies. Dust emitted from the sheer rollers, separating screens, and air classifier is transferred to a cyclone or baghouse for collection and disposal.

Final Processing—Almond meats are now ready either for market or for further processing, such as slicing, roasting and salting, or smoking. Small pieces may be made into meal or pastes for bakery products, etc. Roasting is done by gradually heating the almonds in a rotating drum. This process must be done slowly to prevent the skins and outer layers from burning. The flavor which develops corresponds to the color of the roast. To obtain a light brown color and a medium roast to the almonds, a 500-lb roaster fueled with natural gas would take about 1¼ h at 245°F.

Reference 9

This 1991 test focused on determination of PM-10 emissions and volumetric flow rates for two baghouses at a central California almond growers association, Kerman, California. The devices were designated as the precleaner baghouse (24-in and 60-in outlets) and the huller baghouse (22-in, 36-in, and 70-in outlets), but a process flow diagram was not provided. Sampling was performed using EPA Method 201A: PM-10 and CARB Method 1-4: Volumetric Flow Rates.

The report provided the following testing data.

	Precleaner baghouse		Huller baghouse		
	24-in duct	60-in duct	22-in duct	36-in duct	70-in duct
Airflow, dscfm	16,300	57,900	7,900	16,000	101,200
Total PM, gr/dscf	0.031		0.001		

Process rate information was not provided in the report, but a private communication from Eckley Engineering[11] revealed that field weights (uncleaned, unhulled) and 24-h almond meat production were recorded. Huller/sheller input weight of precleaned almonds was not available. This communication also indicated the precleaner baghouse test results were declared invalid because of a split in one bag. For the huller/sheller, from the sum of mean airflows, an average particulate loading of 0.0012 gr/dscf, and an almond meat production rate of 6.18 tons/h, Eckley estimated an emission factor of 0.21 lb TSP/meat ton. The factor on a field weight basis would be about one-fifth of this value, or 0.04 lb/FWT.

This reference is assigned a rating of B since it is based on a limited number of baghouses and lack of verifiable process information.

4.2 EMISSION FACTOR DEVELOPMENT

Emission factors for total particulate emissions were developed for the almond precleaning and hulling processes. Because of the substantial differences in process air stream handling between facilities, the uncertainties in much of the available data

LANCE-HENNING'S NOTES

Aug-Sept 1992

TESTS FROM Eckley Engineering

~~Fertilizers~~ = Ch 5

ALMONDS

— Berrenda Mesa Almond Hulling
by Truesdail LABORATORIES April 6, 1981
- Precleaner
- Huller #3
- Sheller Line #2
- Gravity Separator

} lbs/hr - no process info

— TRUESDAIL LABORATORIES
for Minnehoma Land and Farming Company
Nov 14, 1979

Precln Baghouse
Huller Baghouse
} lbs/hr - no process info

— Truesdail Lab
for Kernpareil Coop, Inc.
Nov 26, 1980
Huller Baghouse } lbs/hr - no process info

— Cyclone Dust Collector Emission Test Program

*ASK Sept 16, 1986

For Cunha farms

Precleaner Cyclone — lbs/hr : ?no process info?

— Compliance Source Test Report

*ASK Shafter-Wasco Ginning

Oct 30, 1991

Shaker Baghouse — lb/hr > No Process Info ??

Pulseset Baghouse (Injector) — lb/hr

— FIELD DATA SOURCE TEST

MID-STATE MANUFACTURING Oct 20, 1981

*ASK Pre-Cleaner
De-Stoner
48" Muller Cyclone
60" Muller Cyclone
} lbs/hr ⇒ No Process ?? INFO

ENTIRE REPORT? — ~~Exhibit A~~ Truesdail Lab

what is a ton? FWT per Processed ton?

Superior Farming Co

Nov. 5, 1980

Muller #1, #2, Precln #1 - 1CN fabric Collector (Baghouse) — 0.16 lb/TON

AP-42 = 0.016 ← Muller line #3 fabric Collector (Baghouse) 0.015 lb/ton ← Factor ~~of 10~~ more than AP-42

AP-42 = 0.0314 Table 5.1-22 Precleaner #2 fabric Collector (Bag House) — 0.032 lb/ton

Factor of 2 more than AP-42

- DETERMINATION OF PM-10 EMISSIONS AND VOLUMETRIC FLOW RATES FROM THE PRECLEANER BAGHOUSE AND THE HULLER BAGHOUSE

By EcoServe for Eckley Engineering November 8, 1991

- Same Baghouse: 22" outlet Huller Baghouse ← on concentration — has process rate hand written in Processed Tons
  ~~36" outlet Huller Baghouse~~ — only 3 pages of 44
  70" outlet Huller Baghouse = 0.2155 lb TSP

→ Supplement to EE Dwg D 455 Stapled onto Particle Measurement Tech. - Almond Huller Part. ← useless

Supplement Gives rates in processed Tons

Lots of info - where's the report?? Insufficient info to use

.75 $\frac{1 \text{ FWT}}{\text{meat ton}} = f$

1 meat ton = 1.33 FWT

Huller Baghouse $\frac{0.2155 \text{ lb TSP}}{\text{meat ton}} \frac{1.33 \text{ FWT}}{\text{meat ton}} = 0.16$

8/5/92 BLUE DIAMOND GROWERS

916 - 442 - 0771 - Stephan

⇓ onto

I will return call 1:30 p.m. — Dave Baker - (209) 545-6222 → stated ≈ 25% of the weight originally brought into process is recovered as almonds

- Director of Member Relations

⇓ onto

Left message on machine 3:30 — Almond Hullers and Processors Association

(805) - 871 - 2515

Jim Riles - Manager

(805) - 849 - 3217
Bakersfield

8/5/92 Almond Hullers Association ~

Talked w/ lady, who said that this was office only operated in the county Bakersfield is in. She was not of help and wouldn't or couldn't answer any questions

Questions ~~to~~ Ask

~~805-849-3217~~

- Almond Hullers & Processors Association ph #
- # of Hulling Plants
- ← Amount field Weight Tons / #'s nuts produced about 25%.
- → Season - Agust to Mid October
- Roasting plants located near or on huller operations
- → CARB - 1174 Report. Description Accurate?
- other Reports out there?
- Are Almonds Dried before processing.

Wendy Eckley
(209)233-1217

Almond Processing
Source Tests - by Eckley Engineering

- Describes equipment used for source tests
- Tests run on 6 facilities in California which included
  - 14 cyclones
  - one Air Leg
  - Two Baghouses
- Testing by EPA method #5

1 lb = .454 kg

All cyclones	1.85 lbs emissions/FWT
Precleaner Cyclone & Huller B.H.	1.16 lbs /FWT
Precleaner B.H. & Huller Cyclone	0.921 lbs/FWT

$\frac{1.85\ (.45)}{2{,}000\ (.45)} = \frac{.832\ kg}{900\ kg} \frac{1}{1.111} = \frac{0.924}{1000\ kg}$

$\frac{.32\ lbs}{500\ lbs} = \frac{144}{227\ lbs}$

What's a metric ton?
1000 Kg

Arsenic *
Beryllium *
Cadmium *
~~Chromium~~
Copper
Lead *
Manganese *
Mercury *
Nickel *
Sulfur Dioxide

ALMONDS – .1DD NOTES

FWT = Field Weight Ton

Tests run on 14 cyclones
- one Air Leg
- Two Baghouses

} 6 plants in California
- Butte Co.
- Kern Co
- Merced Co
- Stanislaus Co.
- Madera Co.

Look for PM - method #5
PM DISTRIBUTION
Metals?

– Fugitive dust in the cyclone is from the bottom exit of garbage

- Formula for $8{,}000 \leq \frac{Q^2(LTC)}{R^4}$

$$\therefore \frac{CF^2}{m^2}(IN)\ \frac{1}{IN^4} = \frac{CF^2}{m^2\,IN^3}$$

* Best Document I've seen to make or use factors from

$$7.92\ lbs/\cancel{HR}\ \frac{\cancel{HR}}{4.0\ TONS} = 1.98$$

County info
w/ Mag
Used 2D-2D cyclones

NOTES –
EDC NW LESS
MAY 1993

Project 3605-02

5-5-93 conf. call with D. SAFRIET, COWHERD, THOMAS, REISDORF, HENNING, ELL

Re: Nuts & Seeds / DRAFT Add Inlet data to Tab. 4-1 & 4-2 if POSSIBLE

↑ check ORIGINAL DATA

so we have an Uncontrolled EMISS. FACTOR

AIR LEG DATA – ANY FURTHER INFO IN CARB rept.

ECKERLY REPT – recheck

HISTOGRAM or some VISUAL SHOWING DATA SPREAD

Fig 6.10.2-1 PRECLEANER EXIT TO TRASH PILE? INCONSISTENT
or THROUGH CYCLONE? BAGHOUSE

LEAF ASPIRATOR – WHERE AVERAGED? ck. App Tab. 1
IN HULLING or in PRECLEANING

explain FLOT

SCC NOS USED is FOR PEANUTS NOT ALMONDS ~~SALTED & ROASTED~~ NUTS & ~~SEEDS~~

1 30202? – HE WILL SEND INFO ON ASSIGNING

SOURCE CLASS. CODE = 6.10.2-1

Metals – "BELIEVED TO BE" SMALL
add

FUGITIVE EMISS. – Q re: the 10% FACTOR p 6.10.2-2 CLARIFY

Revise & Resubmit

Chatt Mang. will VISIT SAFRIET
MAY 18

REISDORF'S NOTES ON CONF. CALL WITH SAFRIGT

May 5, 1993

1. p 4-2 inlet data - what happened to it? Was there any?

2. p 4-2 air leg - clarify this

3. p 4-3 suggestion: use histogram to give visual clue on how to average the numbers. Show in background doc. [Mean vs. average]

+a p 6.10.2-2 - FUGITIVE MISSIONS - CLARIFY

4. fig. 6.10.2-1
Precleaner - does it go thru cyclones or not

5. leaf aspirator, huller - should they be included in averaging
maybe only 2 tests for hulling
LA's should be in precleaner?

6. 6.10.2-4 0.41 should be 0.47

7. Explain field weight tow (p. 6.10.2-4)

8. SCC's numbers are for peanuts
e.g. 30201 = peanuts
should follow, not duplicate peanuts

precleaner
control w/ cyclone ... Should be 1 codes, not separate for each
" " baghouse control device

we will (30202 or whatever)
propose for us

9. 6.10.2-2 (10% fugitive ... means what?)

10. references?? Throwing out data

THOMAS' NOTES ON CONF. CALL WITH SAFRIGT 5/5/93

① will FAX

SCC nos ⇔ flow diagram

unloading step probably needed even tho data not available

roaster needed also.

units FWT Field Weight Tons

#'s produced (end product)

268 million #

need to use a unit of production or use a factor applied to FWT

Ron Ryen (#4330)

has written up

② Roaster units - may be several types -

conveyer?

single unit rotary?

add to table as no info. available

5/6/93
EWL

3605-02 ALMOND HULLING

NOTES CARB REPORT (1974) — NOTES (HAND WRITTEN) — NO TYPED DATE ON RPT
(MRI Ref #1) TESTING IN SEPT. & OCT. 1974

1. DRYING PROCESS: A. - HARVESTING; B - HULLING E: 1. PRECLEANING 2. HULLING 3. SEPARATIONS

Precleaning — Orchard debris removed to area "for future disposal"

Destoner — particulate trained to cyclone/baghouse

2. TESTS ON 14 CYCLONES (8 FACILITIES), TWO BAGHOUSES (1 FACILITY), 1 AIR LEG (1 FACILITY)

↑ INLET & OUTLET FOR PART. SIZE DISTRIBUTION

↑ OUTLET ONLY

INLET TESTS DID NOT GIVE USEABLE RESULTS — OVERLOADED ANDERSON

3. AIR FLOWS ARE HANDLED / COMBINED / CLEANED DIFFERENTLY BY DIFFERENT OPERATORS

CONCLUSION — FUGITIVE DUST IS LARGEST SOURCE OF EMISSIONS UP TO 100%

① FUGITIVE DUST PLUMES FROM BOTTOM DISCHARGE OF CYCLONES — OPACITIES

② RECEIVING BIN ③ STORAGE PILES, ④ VEHICLE OPERATIONS

FROM REF #1

5/11/93
EWL

3605-02 ALMOND HULLING

TRUESDAIL LABORATORIES REPT. APR 6, 1981 (KERN CO.)

TESTING Feb 9-12, 1981 AT BERENDA MESA FARMS, LOST HILLS CA,

4 BAGHOUSES BY EPA METHOD 5 ON ALMOND HULLING PROCESS

	TWO TEST AVE.	
1. PRECLEANER	0.4 lb/hr	"TESTS RUN WHILE SYSTEMS WAS UNDER NORMAL OPERATING CONDITIONS"
2. HULLER #3	0.61 " "	→ NO THROUGHPUT DATA
3. SHELLING LINE #2	0.14 " "	
4. GRAVITY SEPARATOR	0.30 " "	CALCULATED FOR MULTIPLE EXHAUSTS AS APPROPRIATE
TOTAL	1.46 " "	

TRUESDAIL LAB REPT Nov 14, 1979

TESTING Nov 7-8, 1979 AT MINNEHOMA LAND & FARMING CO., BAKERSFIELD CA (KERN CO.)

ALMOND HULLER - TWO BAGHOUSE EMISSIONS (EPA METHODS TWO RUNS EACH) "NORMAL" OPERATING CONDITIONS (MULTIPLE EXHAUSTS)

	TEST 1	TEST 2	AVE (EWL)
1. PRECLEANER	0.62 lb/hr	0.60 lb/hr	0.61 lb/hr
2. HULLER	2.42 " "	0.85 " "	1.64 " "

TRUESDAIL LAB REPT. Nov 26, 1980

TESTING Nov 10, 1980 KERNPARK COOP, INC., WASCO CA (NORMAL OPERATING COND.)

EPA METH. 5

ALMOND HULLER BAGHOUSE

	TEST #1	TEST 2	
HULLER	0.24 lb/hr	0.22 lb/hr	— SINGLE EXHAUST

TRUESDAIL LAB REPT Nov 5, 1980

TESTING Oct 1, 2 & 6, 1980 AT SUPERIOR FARMING CO, BAKERSFIELD CA

ALMOND HULLER BAGHOUSE EMISSIONS TESTS

3 BAGHOUSES TESTED (THE NAME SAUNCO IS ON DATA SHEETS)

	PROCESS RATE	AVE OF TWO TESTS
1. PRECLEANER #1	16.30 t/hr	5.36 lb/hr
HULLER #1	7.84	
HULLER #2	9.08	
2. PRECLEANER #2	18.67	0.60
3. HULLER LINE #3	10.63	0.16
TOTAL		6.12 lb/hr
		146.9 lb/24 hr.

Emission Inventory Branch
Technical Support Division (MD-14)
Office of Air Quality Planning and Standards
U. S. Environmental Protection Agency
Research Triangle Park, NC 27711
FAX Number: (919) 541-0684

FAX TRANSMISSION

Date: 5-5-93

TO:

NAME	PHONE NUMBER
Margaret Thomas	449
COMPANY/OFFICE: MRI	FAX NUMBER: @ 8420

FROM:

NAME	PHONE NUMBER
Dallas Smith	919-541-5371

COMMENTS:

Attached is the information about SCC's that we talked

Number of Pages (including cover sheet): 3

If you did not receive all the pages, please contact the following person:

Name: _____ Phone Number: _____

Clean sheet

Date Rec'd:

AIRS SCC REQUEST FORM

1. Describe the emission point for which an SCC is requested. Include a diagram of the overall process showing related emission points with existing SCCs, if possible.

2. Is the emission point controlled, either by add-on equipment or process modifications?

3. Does the emission point include both process and fuel emissions?

4. What industries use this operation? Include SIC if known.

5. What pollutants are likely emitted and which can definitely be ruled out?

6. Are any emissions estimates or test reports available? What process parameter (thruput or activity measure) can emissions be related to?

7. Are there related or similar processes in other industries with existing SCC codes?

8. Proposed Full or Partial SCC (8 digits):
9. SCC6 Name (if not existing):
10. Proposed Description in AIRS ("SCC8", 70 characters):
11. Proposed Short Description (28 characters):
12. Primary Activity Units Description (40 characters):
13. Requested by:
Phone:
Address:

Add:
Change:
Delete:

Date Completed:

By:

Date Rec'd: 5-6-93

AIRS SCC REQUEST FORM

1. Describe the emission point for which an SCC is requested. Include a diagram of the overall process showing related emission points with existing SCCs, if possible.

2. Is the emission point controlled, either by add-on equipment or process modifications? particulate sources usually controlled by cyclones or baghouses.

3. Does the emission point include both process and fuel emissions? possibly fuel emissions from roaster?

4. What industries use this operation? Include SIC if known.
Almond Processing - 2068

5. What pollutants are likely emitted and which can definitely be ruled out? total particulate & PM_{10} from loading/unloading, cleaning & hulling steps. VOC likely from roasting.

6. Are any emissions estimates or test reports available? What process parameter (thruput or activity measure) can emissions be related to? ~~EF 5.5~~ Tests from CA documented in AP-42 background report.

7. Are there related or similar processes in other industries with existing SCC codes? 3-02-017-01 thru 05 for peanut processing

8. Proposed Full or Partial SCC (8 digits): (see over)
9. SCC6 Name (if not existing): change 3-02-017 to "Nut Processing
10. Proposed Description in AIRS ("SCC8", 70 characters): (see over)
11. Proposed Short Description (28 characters): (see over)
12. Primary Activity Units Description (40 characters): Tons finished product or Tons Field Weight ?
13. Requested by: Dallas Safriet

Phone:
Address:

Add: ✓
Change:
Delete:

Date Completed: By:

3-02-017-11

scc8- Almond Processing: Loading/Unloading Fugitives

short- Almonds: Load/Unload Fugitive

UNITS:

3-02-017-12

scc8- Almond Processing: All Precleaning Steps

short- Almonds: Precleaning

UNITS:

3-02-017-13

scc8- Almond Processing: All Hulling & Separating Steps

short- Almonds: Hulling/Separating

UNITS:

3-02-017-17

scc8- Almond Processing: Roaster

short- Almonds: Roaster

UNITS:

MIDWEST RESEARCH INSTITUTE
425 Volker Boulevard
Kansas City, Missouri 64110
Telephone (816) 753-7600
Telefax (816) 753-8420

Date: August 28, 1992

To: Dallas Safriet
EPA/EIB/TSD (MD-14)
U.S. Environmental Protection Agency
Research Triangle Park, NC 27711

Subject: Almond Processing Emission Factors

Data from two almond hulling source tests were recently located that appear to be good tests for emission factor development. MRI has requested the full reports listed below to review and verify the source tests.

1. Determination of PM-10 Emissions and Volumetric Flow Rates from the Precleaner Baghouse and the Huller Baghouse Located in the Central California Almond Growers Association in Cerman, California. Eckley Engineering, Fresno, CA, November 1991.

2. Almond Hullers Baghouse Emissions Tests, Superior Farms, Truesdail Laboratories, Los Angeles, CA, November 1980.

From the summary data we obtained, both the precleaner baghouse and the huller baghouse emission factors can be revised. The following lists the anticipated revision upon review and verification of the source tests.

Precleaner Baghouse:

Current proposed emission factor - 0.0014 lbs/FWT

Revised proposed emission factor - 0.017 lbs/FWT

Huller Baghouse:

Current proposed emission factor - 0.016 lbs/FWT

Revised proposed emission factor - 0.059 lbs/FWT

MIDWEST RESEARCH INSTITUTE
425 Volker Boulevard
Kansas City, Missouri 64110
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Telefax (816) 753-8420

Both the change in the precleaner baghouse (factor of 12) and the huller baghouse (factor of 3.7) are significant in magnitude.

Since the original proposed emission factor used only one source test, MRI feels the revised factors are potentially more representative of the industry. This depends upon review and verification of the documents.

Enclosed are the four copies requested of the current Emission Factor Document for AP-42, Section 6.15.2, Draft Report.

I will contact you to answer any questions you may have.

Sincerely,

David H. Reisdorph
Senior Economist

MIDWEST RESEARCH INSTITUTE

August 27, 1992

To: AP-42, Food & Agriculture Project File

From: Lance Henningd

Subject: Phone Log

Spoke with Wendy Eckley of Eckley Engineering. Discussed source emission tests completed for Almond Hulling. Mrs. Eckley identified two reports not in MRI's possession -

- Report by Ecoserve
  Emission testing at Central California Almond Growers Association, in Kerman, CA, Oct. 1991.

- Report by Truesdail Laboratories
  Emission tests at Superior Farming in Bakersfield, CA.

She stated she would talk with each firm to obtain copies of the report.

Mrs. Eckley explained that her firm would be source testing several Almond Hulling facilities this season in the fall.

MIDWEST RESEARCH INSTITUTE

September 4, 1992

To: AP-42, Food & Agriculture Project File

From: Lance Henningo

Subject: Phone Log

Called Wendy Eckley of Eckley Engineering to ask questions regarding the recently received Ecoserve report.

> Determination of PM-10 Emissions and Volumetric Flow Rates from the Precleaner Baghouse and the Huller Baghouse located in the Central California Almond Growers Association in Kerman, California, Ecoserve, Inc., November 8, 1991.

I asked if process information was available for the facility including the amount of almonds processed through the facility.

Mrs. Eckley said she would get the information to me ASAP. She also mentioned the precleaner baghouse test was bad, due to a tear in the bag.

ECOSERVE, Inc.
AIR QUALITY MANAGEMENT CONSULTANTS
Since 1972

Corporate Office
3890 Railroad Avenue
Pittsburg, California 94565

Operations
690-A Garcia Avenue
Pittsburg, California 94565

- Permitting
- Consultation
- Source Testing
- Modeling
- Risk Management
- Ambient Monitoring
- Industrial Hygiene

DETERMINATION OF PM-10 EMISSIONS AND VOLUMETRIC FLOW RATES FROM THE PRECLEANER BAGHOUSE AND THE HULLER BAGHOUSE LOCATED IN THE CENTRAL CALIFORNIA ALMOND GROWERS ASSOCIATION IN KERMAN, CALIFORNIA

Test Dates: October 1,2, and 3, 1991
Report Date: November 8, 1991

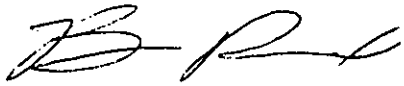
Prepared for:
Eckley Engineering
255 N. Fulton Street, Ste. 105
Fresno, Ca 93701
Attention: Mr. Robert C. Eckley, P.E.

Project # 1779

Prepared by:

Susan Huang

Reviewed by:



Bruce Randall

SUMMARY OF RESULTS
(PM10 TESTS)

Client: Eckley Engineering

Test Unit: Huller Baghouse

Test Location: 22" Duct Outlet

Test Date: 10/3/91

Time:	857-1100	1119-1320	1335-1537
Volumetric Flow Rates			
ACFM:		8400	
SDCFM:		7900	
Gaseous Concentrations			
O2 (% vol. dry):		20.9	
CO2 (% vol. dry):		0.0	
H2O (% vol.)	1.53	1.98	1.96
SDCF:	51.44	52.57	49.26
PM Weights (mg)			
PM10:	2.51	2.51	0.92
Total PM:	5.34	2.51	4.31
PM10 (%):	47.0	100.0	21.3
PM Concentrations (grains/SDCF)			
PM-10:	7.5E(-4)	7.4E(-4)	2.9E(-4)
Total PM:	1.6E(-3)	7.4E(-4)	1.3E(-3)
50% Effective Cut Diameter (um)			
		8.8	

6.178 Tons meate/hr

Huller/Sheller Factor

$$\frac{(119{,}500)(0.0013)(60)}{(7000)(6.178)} = 0.2155 \text{ lb TSP/meate ton}$$

$$\frac{(\quad)(0.00029)(\quad)}{(\quad)(\quad)} = 0.0481 \text{ lb } PM_{10}/\text{meate ton}$$

SUMMARY OF RESULTS
(VOLUMETRIC FLOW RATES DETERMINATIONS)

Client: Eckley Engineering

Test Date: 10/1/91

60" Duct Outlet from the Precleaner Baghouse:

Run #:	1	2	3
Volumetric Flow Rates			
ACFM:	62600		
SDCFM:	57[illegible]		[illegible]00
Gaseous Concentratio			
O2 (% vol. dry):		20.9	
CO2 (% vol. dry):		0.0	
H2O (% vol.):		1.02	

VOID TORN BAG

36" Duct Outlet from the Huller Baghouse:

Run #:	1	2	3
Volumetric Flow Rates			
ACFM:	17600	17700	18000
SDCFM:	15800	16000	16200
Gaseous Concentrations			
O2 (% vol. dry):		20.9	
CO2 (% vol. dry):		0.0	
H2O (% vol.):		1.82	

70" duct Outlet from the Huller Baghouse:

Run #:	1	2	3
Volumetric Flow Rates:			
ACFM:	113600	112600	115000
SDCFM:	102000	101200	103300
Gaseous Concentrations			
O2 (% vol. dry):		20.9	
CO2 (% vol. dry):		0.0	
H2O (% vol.):		1.82	

09/08/92 1230 1 of 1

From: Wendy Eckley
Eckley Engineering
Phone (209) 233-1217 Fax 209.233.5756

To: Lance Henning
MRI
816.753.8420

Lance -

To answer your questions about the Central California Almond Growers October, 1991, Ecoserve source test:

1. The precleaner test was declared invalid because of a split in one bag. We have photos of the split. (The most interesting thing to me was that there was a tape from an audio cassette that had stuck in the bag.) Because of the placement of the test ports, the 60"ϕ duct airflow would represent the total airflow for the precleaner.

2. The sum of the mean airflows from the three ducts (22"ϕ, 36"ϕ, 72"ϕ) should be used for the huller/sheller - 126,067 DSCFM. At 6.18 tons meats per hour and 0.0012 grains/DSCF, I get 0.21 lb TSP/meats ton and 0.10 lb PM_{10}/meats ton.

3. To determine the weights entering the precleaner, we weighed the incoming product (field weight tons). Since the test was invalid, I won't send the chart; but just to give you an idea of the relative process rate between precleaner and huller, the incoming product averaged just under 25 tons/hour. Two of the problems in computing emissions factors historically were that there wasn't wide understanding that the precleaner and huller operate at different rates and that the precleaned (in-hull) product weighs some 30% (depending on variables) less than the incoming (field-weight) product.

4. Since we could not measure directly the process weight into the huller/sheller, we used the 24-hour meats production to determine the factors in meats tons. Because the facility operates at a uniform rate and had no problems necessitating shut-downs during the period, we determined that the mean hourly rate would be representative. We used another day's production as a control and found virtually no difference. (It is not often among our various types of clients that production rate is uniform enough to be able to use hourly means.)

Does that answer your questions so far? Call or FAX, if there are more. I mailed you something on cotton gins - even if it is too late - just so you'd get a hint of why I'm so frustrated with the old AP-42.

MIDWEST RESEARCH INSTITUTE

March 10, 1993

To: AP-42, Food & Agriculture Project File

From: Lance Henning LH

Subject: Phone Log

Called Wendy Eckley to inquire about source emission testing performed by Eckley Engineering.

Eckley tested 20 cyclones last almond hulling season. She feels that the results show properly operated cyclones are cleaner than expected.

Each facility was unique and operated anywhere from 3 cyclones to 20 cyclones for their almond hulling operation, but she does not have the specific number of cyclones for each site. The worst case cyclone was 8 lbs/day PM-10.

The report has not been completed due to her husband's illness. She was unsure when the report would be complete. She stated she would send preliminary numbers for the testing.

Section 4 Reference 10
AP-42 Reference ___

Emission Test Report Review Checklist--Short Form

Reviewer: BRIAN SHRAGER
Review Date: 4/20/94

A. Background Information

1. Facility name: Harris Woolf California Almonds
   Location: Coalinga, California
2. Source category: Salted and Roasted Nuts and Seeds
3. Test date: Sept. 23 and 27, 1991
4. Test sponsor: Harris Woolf
5. Testing contractor: Steiner Environmental, Inc.
6. Purpose of test: Compliance
7. Pollutants measured (include test method and indicate if valid): Filterable PM - Method 5
   Condensible Inorganic PM - Method 5 back-half analysis
8. Process overview: Attach a process description and a block diagram. Identify processes tested with letters from the beginning of the alphabet (A, B, C, etc...) and APC systems with letters from the end of the alphabet (V, W, X, etc...). Also identify test locations with Arabic numerals (1,2,3, ...). Using the ID symbols from the diagram, complete the table below.

Test ID	Process	Process ID	Emissions tested		APCD (controlled emissions only)
			Uncontrolled	Controlled	
1	Receiving/Precleaning	A		✓	ID: Y Type: Fabric filter Model #: Sauneo RA12-252-5040
2	Almond hulling and shelling	B		✓	ID: Z Type: Fabric filter Model #: Sauneo RA12-32-6240
					ID: Type: Model #:
					ID: Type: Model #:

B. Process Information

1. Provide a brief narrative description of the process and attach process flow diagram. (Note: If the process description provided in the test report is adequate, attach a copy here.)

SECTION 1

INTRODUCTION

At the request of Harris Woolf California Almonds, Steiner Environmental, Inc. conducted a series of emission tests on the effluent of two baghouses located at their almond processing plant located near Coalinga, California. These tests were conducted on September 23 and September 27, 1991. The purpose of these tests was to determine compliance with Fresno County APCD Rules and Regulations.

Almonds are hauled to the plant by trucks and are bottom dumped into a pit with a conveyor. The emissions from this almond receiving/pre-cleaning facility (Permit to Operate No. 1140140101R) are controlled by a Saunco baghouse (Model No. RA12-252-5040) containing 252 polyester dacron bags each six inches in diameter and 144 inches long. The total surface area is 5040 ft^2 and the air-to-cloth ratio is 6.94 to 1.0 at an air flow of 35,000 acfm.

Almonds are hulled and shelled in another part of the plant and the emissions from these processes are also controlled by a baghouse (Permit to Operate No. 1140140102R). A Saunco baghouse (Model RA12-312-6240) with one compartment containing 312 polyester dacron bags each six inches in diameter and 144 inches long with a rated air flow of 77,500 acfm and an airleg recycle with a rated air flow of 23,000 acfm. The

total bag surface area is 6,240 ft^2 for an air-to-cloth ratio of 12.4 to 1.0.

Triplicate particulate tests were performed using EPA Method 5 on each outlet duct from each baghouse prior to the fan. The almond receiving/pre-cleaning baghouse has one stack. The almond hulling and shelling baghouse has two stacks, both of which were tested simultaneously. No PM_{10} tests were conducted. Fresno County has agreed that if the baghouses passed the particulate tests, then they would also pass the PM_{10} tests, since PM_{10} is a fraction of the total particulate emitted from the baghouses.

Section 2 of the report presents the test matrix for this program.

C. 1. List any APCD parameters (supplied in the test report) below.

APCD ID	Parameter	Units	Readings			
			Run 1	Run 2	Run 3	Run 4
1	# Bags	#	252			
Type of APCD: Fabric filter	Surface Area	Ft^2	5040			
	Air-to-cloth	Ratio	6.94 to 1.0			
	Air Flow	ACFM	35,000			
2	# Bags	#	312			
Type of APCD: Fabric filter	Surface Area	Ft^2	6240			
	Air-to-cloth	Ratio	12.4 to 1.0			
	Air Flow	ACFM	77,500			
Type of APCD:						

2. Include any additional information (such as capture techniques for fugitive systems) and descriptions of the air pollution control systems (use a separate page if necessary).

D. Emission Data/Mass Flux Rates/Emission Factors

Test ID	Parameter	Units	Values reported			
			Run 1	Run 2	Run 3	Run 4
	Stack temperature					
	Moisture					
	Oxygen					
	Volumetric flow, actual					
	Volumetric flow, standard					
	Percent isokinetic					
Circle: Production or feed rate Capacity:						
	Pollutant concentrations:					
	Pollutant mass flux rates:					
	Emission factors:					

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D. Emission Data/Mass Flux Rates/Emission Factors

Test ID	Parameter	Units	Values reported			
			Run 1	Run 2	Run 3	Run 4
1	Stack temperature	Deg F	93.29	100.17	101.08	
Receiving and Pre-cleaning	Moisture	%	1.15	0.85	0.83	
	Oxygen	%	20.9	20.9	20.9	
	Volumetric flow, actual	acfm	33123	32307	30276	
	Volumetric flow, standard	dscfm	29563	29000	27084	
	Isokinetic variation	%	95.5	94.9	99.1	
Circle: Production or feed rate Capacity:		TPH	17.35	17	16.1	
	Pollutant concentrations:					
	Filterable PM	G/dscf	0.0048	0.0076	0.0076	
	Condensible inorganic PM	G/dscf	0.0003	0.0002	0.0003	
	Pollutant mass flux rates:					
	Filterable PM	lb/hr	1.216	1.889	1.764	
	Condensible inorganic PM	lb/hr	0.076	0.050	0.070	
	Emission factors:					Average
	Filterable PM	lb/ton	0.0701	0.111	0.110	0.0969
	Condensible inorganic PM	lb/ton	0.00438	0.00292	0.00433	0.003877

Test ID	Parameter	Units	Values reported			
			Run 1	Run 2	Run 3	Run 4
2A	Stack temperature	Deg F	77.21	92.46	99.46	
Hulling and shelling	Moisture	%	1.13	1.19	0.88	
	Oxygen	%	20.9	20.9	20.9	
	Volumetric flow, actual	acfm	63063	59412	57915	
	Volumetric flow, standard	dscfm	59072	53811	51721	
	Isokinetic variation	%	101.25	99.8	99.8	
Circle: Production or feed rate Capacity:		TPH	18.6	14.6	21.4	
	Pollutant concentrations:					
	Filterable PM	G/dscf	0.0018	0.0014	0.0012	
	Condensible inorganic PM	G/dscf	0.0002	0.0002	0.0009	
	Pollutant mass flux rates:					
	Filterable PM	lb/hr	0.911	0.646	0.532	
	Condensible inorganic PM	lb/hr	0.101	0.092	0.399	
	Emission factors:					Average
	Filterable PM	lb/ton	0.0490	0.0442	0.0249	0.0394
	Condensible inorganic PM	lb/ton	0.00544	0.00632	0.0186	0.0101

Test ID	Parameter	Units	Values reported			
			Run 1	Run 2	Run 3	Run 4
2B	Stack temperature	Deg F	79.46	94.04	101.46	
Hulling and shelling	Moisture	%	1.28	1.02	1.05	
	Oxygen	%	20.9	20.9	20.9	
	Volumetric flow, actual	acfm	15548	16170	15736	
	Volumetric flow, standard	dscfm	14500	14661	14039	
	Isokinetic variation	%	99.57	94.53	92.39	
Circle: Production or feed rate Capacity:		TPH	18.6	14.6	21.4	
	Pollutant concentrations:					
	Filterable PM	G/dscf	0.002	0.0015	0.0017	
	Condensible inorganic PM	G/dscf	0.0003	0.0007	0.0004	
	Pollutant mass flux rates:					
	Filterable PM	lb/hr	0.249	0.188	0.205	
	Condensible inorganic PM	lb/hr	0.037	0.088	0.048	
	Emission factors:					Average
	Filterable PM	lb/ton	0.0134	0.0129	0.0096	0.0119
	Condensible inorganic PM	lb/ton	0.00200	0.00603	0.0022	0.0034

TOTAL EMISSION FACTORS FOR HULLING/SHELLING (2A+2B)

		RUN 1	RUN 2	RUN 3	AVERAGE
Filterable PM	lb/ton	0.0624	0.0571	0.0344	0.0513
Condensible inorganic PM	lb/ton	0.00745	0.0123	0.0209	0.0136

8 p's
4 h's

				um. 0.65	1.1	2.1	3.3	4.7	7.0	11		
BOGETTI	C	P	D	0.1	1.0	6.8	21.4	45.1	66.1	82.5	100	AVG. ALL THE "P's"
BOERSMA	C	P	D	0.7	2.3	12.5	33.5	69.6	87.7	95.4	100	
		H	D	0.6	1.7	6.3	17.0	45.3	69.5	84.8	100	AVG. ALL THE "H's"
DEGROOT	C	P	D	5.1	9.7	20.7	39.4	65.9	81.5	90.7	100	
		H	D		1.7	9.3	24.7	55.6	75.5	88.7	100	
SCOTT	C	P	D	0.32	1.50	6.06	18.83	53.42	80.4	94.1	100	
WINCHESTER	C	P	D	0.3	1.6	6.2	18.4	51.4	76.3	91.3	100	
		H	D	1.2	2.5	5.5	14.4	42.6	68.1	86.5	100	
DUNLAP	C	P	D	0.79	2.03	6.5	21.2	53.7	79.1	93.8	100	
N.M.H.A.	C	P	D	1.6	4.7	14.5	34.7	60.6	75.4	85.6	100	
		SD	D	5.7	13.0	18.4	27.3	45.0	61.8	78.5	~100	← ONLY 1
ATWATER	C	P	D	4.0	9.1	22.2	43.0	64.2	75.9	85.4	100	
		H	D	0.27	0.69	2.48	7.31	19.17	40.01	53.38	100	
CORTEZ	BH	P	D	26.4	35.1 ←	46.0	57.5	67.8	81.0	88.5	~100	← ONLY 1
	BH	H	D	13.5	25.0	37.2	50.0	57.7	71.2	85.3	~100	← ONLY 1

P - precleaner
H - Huller
SD - Screen Decks Classifier

FILE NO. C-4-029

TABLE 3, PAGE 1 of 2

State of California

AIR RESOURCES BOARD

Division of Implementation and Enforcement

PARTICLE SIZE MASS DISTRIBUTION SHOWN AS
PERCENT PER STAGE AND CUMULATIVE PERCENT PER STAGE

NAME OF HULLER	*	**	STAGE NO. OF ANDERSON SAMPLER 7	6	5	4	3	2	1	0
			AERODYNAMIC PARTICLE SIZE IN MICRONS <0.65	<1.1	<2.1	<3.3	<4.7	<7.0	<11	≥11
BOGETTI	P	B	0.1	0.8	5.6	14.7	23.7	20.9	16.4	17.4
	P	D	0.1	1.0	6.8	21.4	45.1	66.1	82.5	100
BOERSMA	P	B	0.07	1.6	10.2	21.0	36.1	18.1	7.7	4.5
	P	D	0.7	2.3	12.5	33.5	69.6	87.7	95.4	100
	H	B	0.7	1.1	4.6	10.7	28.2	24.2	15.4	15.1
	H	D	0.6	1.7	6.3	17.0	45.3	69.5	84.8	100
DEGROOT	P	B	5.2	4.6	11.0	18.7	26.5	15.6	9.2	9.2
	P	D	5.1	9.7	20.7	39.4	65.9	81.5	90.7	100
	H	B	-	1.8	7.6	15.3	30.8	19.9	13.2	11.2
	H	D	-	1.7	9.3	24.7	55.6	75.5	88.7	100
SCOTT	P	B	0.32	1.17	4.6	12.8	34.6	27.0	13.7	5.9
	P	D	0.32	1.50	6.06	18.83	53.42	80.4	94.1	100
WINCHESTER	P	B	0.3	1.3	4.6	12.2	33.0	24.9	15.0	8.7
	P	D	0.3	1.6	6.2	18.4	51.4	76.3	91.3	100
	H	B	1.2	1.2	3.0	8.4	28.2	25.5	18.4	13.5
	H	D	1.2	2.5	5.5	14.4	42.6	68.1	86.5	100
DUNLAP	P	B	0.79	1.3	4.9	15.0	33.7	27.2	15.5	6.3
	P	D	0.79	2.03	6.5	21.2	53.7	79.1	93.8	100
N.M.H.A.	P	B	1.6	3.2	9.8	20.1	25.9	14.8	10.2	14.4
	P	D	1.6	4.7	14.5	34.7	60.6	75.4	85.6	100
	SD	B	5.7	7.3	5.4	8.9	17.7	16.8	16.7	21.5
	SD	D	5.7	13.0	18.4	27.3	45.0	61.8	78.5	100
ATWATER	P	B	4.0	5.2	13.1	20.8	21.2	11.6	9.6	14.6
	P	D	4.0	9.1	22.2	43.0	64.2	75.9	85.4	100
	H	B	0.27	0.43	1.79	4.83	11.86	20.84	13.37	46.64
	H	D	0.27	0.69	2.48	7.31	19.17	40.01	53.38	100

*P = Precleaner
H = Huller
SD = Screen decks and classifier

**B = % of mass collected per stage at outlet of cyclone.
D = Cumulative % of mass collected per stage at outlet of cyclone.

FILE NO. C-4-029

TABLE 3, PAGE 2 OF 2

State of California

AIR RESOURCES BOARD

Division of Implementation and Enforcement

PARTICLE SIZE MASS DISTRIBUTION SHOWN AS
PERCENT PER STAGE AND CUMULATIVE PERCENT PER STAGE

NAME OF HULLER	*	**	STAGE NO. OF ANDERSON SAMPLER							
			7	6	5	4	3	2	1	0
			AERODYNAMIC PARTICLE SIZE IN MICRONS							
			<0.65	<1.1	<2.1	<3.3	<4.7	<7.0	<11	>11
CORTEZ (BAGHOUSES)	~~P~~	~~B~~	~~26.4~~	~~8.6~~	~~10.9~~	~~11.5~~	~~10.3~~	~~13.2~~	~~7.5~~	~~11.5~~
	P	D	26.4	35.1	46.0	57.5	67.8	81.0	88.5	100
	~~H~~	~~B~~	~~13.5~~	~~11.5~~	~~12.2~~	~~12.8~~	~~7.7~~	~~13.5~~	~~14.1~~	~~14.7~~
	H	D	13.5	25.0	37.2	50.0	57.7	71.2	85.3	100

*See footnote at the bottom of page 1, Table 3
**See footnote at the bottom of page 1, Table 3

Section 4 Reference 11
AP-42 Reference __

Emission Test Report Review Checklist--Short Form

Reviewer: BRIAN SHRAGER
Review Date: 4/20/94

A. Background Information

1. Facility name: HARRIS WOOLF CALIF. ALMONDS
   Location: COALINGA, CA
2. Source category: SALTED AND ROASTED NUTS AND SEEDS
3. Test date: SEPT. 14, 1992
4. Test sponsor: HARRIS WOOLF
5. Testing contractor: STEINER ENVIRONMENTAL
6. Purpose of test: COMPLIANCE
7. Pollutants measured (include test method and indicate if valid): Filterable PM - EPA Method 5
   Cond. Inorganic PM - M5 back-half analysis
8. Process overview: Attach a process description and a block diagram. Identify processes tested with letters from the beginning of the alphabet (A, B, C, etc...) and APC systems with letters from the end of the alphabet (V, W, X, etc...). Also identify test locations with Arabic numerals (1,2,3, ...). Using the ID symbols from the diagram, complete the table below.

Test ID	Process	Process ID	Emissions tested		APCD (controlled emissions only)
			Uncontrolled	Controlled	
1	Receiving / Pre-cleaning	A		✓	ID: Z Type: Fabric Filter Model #: Sauvco RA12-252-5040
					ID: Type: Model #:
					ID: Type: Model #:
					ID: Type: Model #:

B. Process Information

1. Provide a brief narrative description of the process and attach process flow diagram. (Note: If the process description provided in the test report is adequate, attach a copy here.)

See a review of 9/23,27/91 Test Report @ same facility.

C. 1. List any APCD parameters (supplied in the test report) below.

See review of 9/91 Test Report @ same facility

APCD ID	Parameter	Units	Readings			
			Run 1	Run 2	Run 3	Run 4
Type of APCD:						
Type of APCD:						
Type of APCD:						

2. Include any additional information (such as capture techniques for fugitive systems) and descriptions of the air pollution control systems (use a separate page if necessary).

D. Emission Data/Mass Flux Rates/Emission Factors

Test ID	Parameter	Units	Values reported			
			Run 1	Run 2	Run 3	Run 4
	Stack temperature					
	Moisture					
	Oxygen					
	Volumetric flow, actual					
	Volumetric flow, standard					
	Percent isokinetic					
Circle: Production or feed rate Capacity:						
	Pollutant concentrations:					
	Pollutant mass flux rates:					
	Emission factors:					

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D. Emission Data/Mass Flux Rates/Emission Factors

Test ID	Parameter	Units	Values reported			
			Run 1	Run 2	Run 3	Run 4
1	Stack temperature	Deg F	77.13	91.38	97.46	
Receiving and Pre-cleaning	Moisture	%	0.78	0.98	0.99	
	Oxygen	%	20.9	20.9	20.9	
	Volumetric flow, actual	acfm	33144	32318	33840	
	Volumetric flow, standard	dscfm	30439	28961	29964	
	Isokinetic variation	%	97.05	91.98	96.04	
Circle: Production or feed rate Capacity:		TPH	13.8	13.8	15.6	
	Pollutant concentrations:					
	Filterable PM	G/dscf	0.004	0.0023	0.0032	
	Condensible inorganic PM	G/dscf	0.0002	0.0002	0.0003	
	Pollutant mass flux rates:					
	Filterable PM	lb/hr	1.044	0.571	0.822	
	Condensible inorganic PM	lb/hr	0.052	0.050	0.077	
	Emission factors:					Average
	Filterable PM	lb/ton	0.0756	0.041	0.053	0.0566
	Condensible inorganic PM	lb/ton	0.00378	0.00360	0.00494	0.004106

ALMOND HULLERS and PROCESSORS ASSOCIATION

3900 Bracburn Drive
Bakersfield, CA 93306
(805) 871-2515
FAX (805) 872-3830

June 18, 1993

VIA FAX

Mr. Jim Southerland
Office of Air Quality Management
United States Environmental Protection Agency
Research Triangle Park, NC 27711

Ref:Emission Factor Documentation for AP-42, Section 6.10.2 (DRAFT)

Dear Mr. Southerland,

Thank you for the opportunity to review the reference document.

A copy of the referenced document was mailed to this office on May 25. It was not received until a little over a week later.

A review of the document caused me to forward it to the environmental committee of our organization. They in turn felt that an environmental engineer was required to do a proper review. This person has been hired and is working on a report to me.

It would be most helpful if your office could forward the documentation that was cited in phone conversations with Ms. Wendy Eckley. This is referenced on page 4-8 as reference 11.

The draft was apparently written by persons not entirely familiar with the current status and methods of processing almonds in California. I hope to be able to bring this in conformity with the current practices.

We request a delay in forwarding the review. It is hoped that we will have the necessary information in time to complete the work by July 7.

Thank you for your consideration.

Sincerely,

Jim Ryals
Manager

Nancy
Please "refax" to
Roy Newlight @ MRI in Cary
677-0065
JATS 6/20

ALMOND HULLERS & PROCESSORS ASSOCIATION
3900 BRAEBURN DRIVE
BAKERSFIELD, CA. 93306
(805)871-2515
FAX (805)872-3830

ADDRESSEE Ms. Nancy Guy

NUMBER OF PAGES INCLUDING THIS COVER 2

SENDER Jim Ryals, Manager, AHPA

COMMENTS Thank you for your assistance in getting this in the proper office.

PLEASE NOTIFY SENDER OF RECEPTION PROBLEMS AT (805)871-2515.

Jim Ryals
Mon/Tue 209-883-0403
Wed-Fri - 916-895-8686

FAX TRANSMITTAL

To Roy Newlight From Jim Southerland
Dept./Agency Phone # Fax #
Fax # 5099-101 GENERAL SERVICES ADMINISTRATION
NSN 7540-01-317-7368
# of pages ▶ 2

To: Ed Lawless

Fm: Roy Neulicht

- EPA received the attached note.

- Our Action item is to find the documentation referred to (Reference 11).

~ Do you know who worked on this?? (I don't have a copy)

~ Could find out <u>who</u> was referenced in the communication? And possibly find out where the documentation is?

~ call me please 919-677-0249 x 5126

Thanks — Roy

MIDWEST RESEARCH INSTITUTE

March 10, 1993

To: AP-42, Food & Agriculture Project File

From: Lance Henning

Subject: Phone Log

Called Wendy Eckley to inquire about source emission testing performed by Eckley Engineering.

Eckley tested 20 cyclones last almond hulling season. She feels that the results show properly operated cyclones are cleaner than expected.

Each facility was unique and operated anywhere from 3 cyclones to 20 cyclones for their almond hulling operation, but she does not have the specific number of cyclones for each site. The worst case cyclone was 8 lbs/day PM-10.

The report has not been completed due to her husband's illness. She was unsure when the report would be complete. She stated she would send preliminary numbers for the testing.

ALMOND PROCESSING

	kg/Mg	lb/ton	DATA RATING	REF	
Precleaner cyclone	0.99	1.98	B		
	0.12	0.23	B		
	0.37	0.74	B		
	0.44	0.88	B	1	
	0.72	1.44	B	1	
	0.89	1.78	B	1	
	0.18	0.35	B	1	
	0.11	0.21	B	1	
	0.48	0.95			C
Precleaner Baghouse	0.00070	0.0014	B	1	
	0.016	0.032	B	3	
	0.0084	0.017			E
Huller cyclone	0.70	1.39	B	1	
	0.89	1.78	B	1	
	0.38	0.75	B	1	
	0.65	1.30	B	1	
	0.22	0.44	B	1	
	0.57	1.1			C
Huller baghouse	0.0080	0.016	B	1	
	0.0075	0.015	B	3	
	0.0078	0.016			E
Classifier, screen deck cyclone	0.20	0.40	B	1	E
Air leg	0.26	0.51	B	1	E

	Initials	Date
Prepared By		
Approved By		

WILSON JONES COMPANY G7512D ColumnWrite (-)

MADE IN U.S.A.

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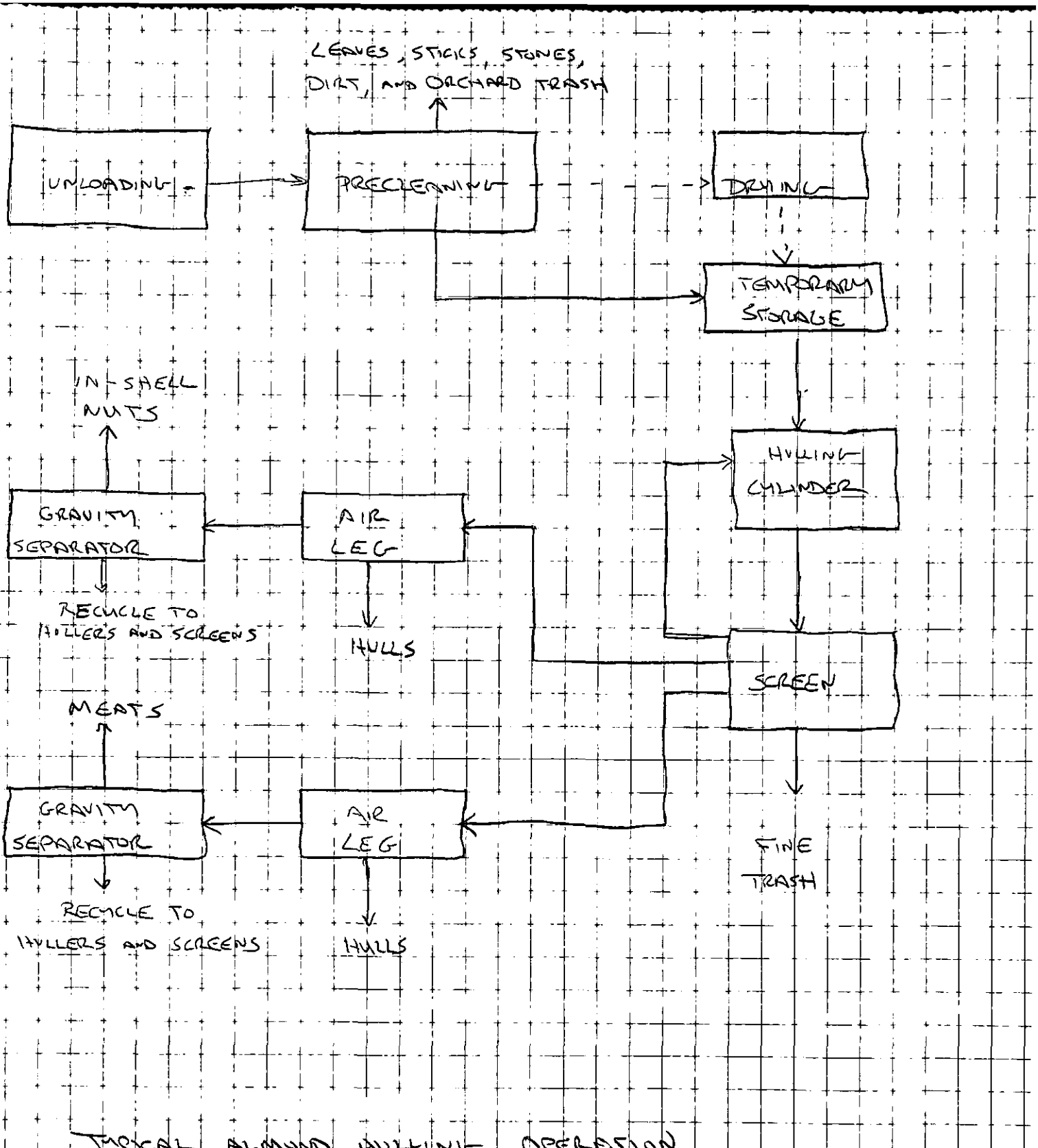
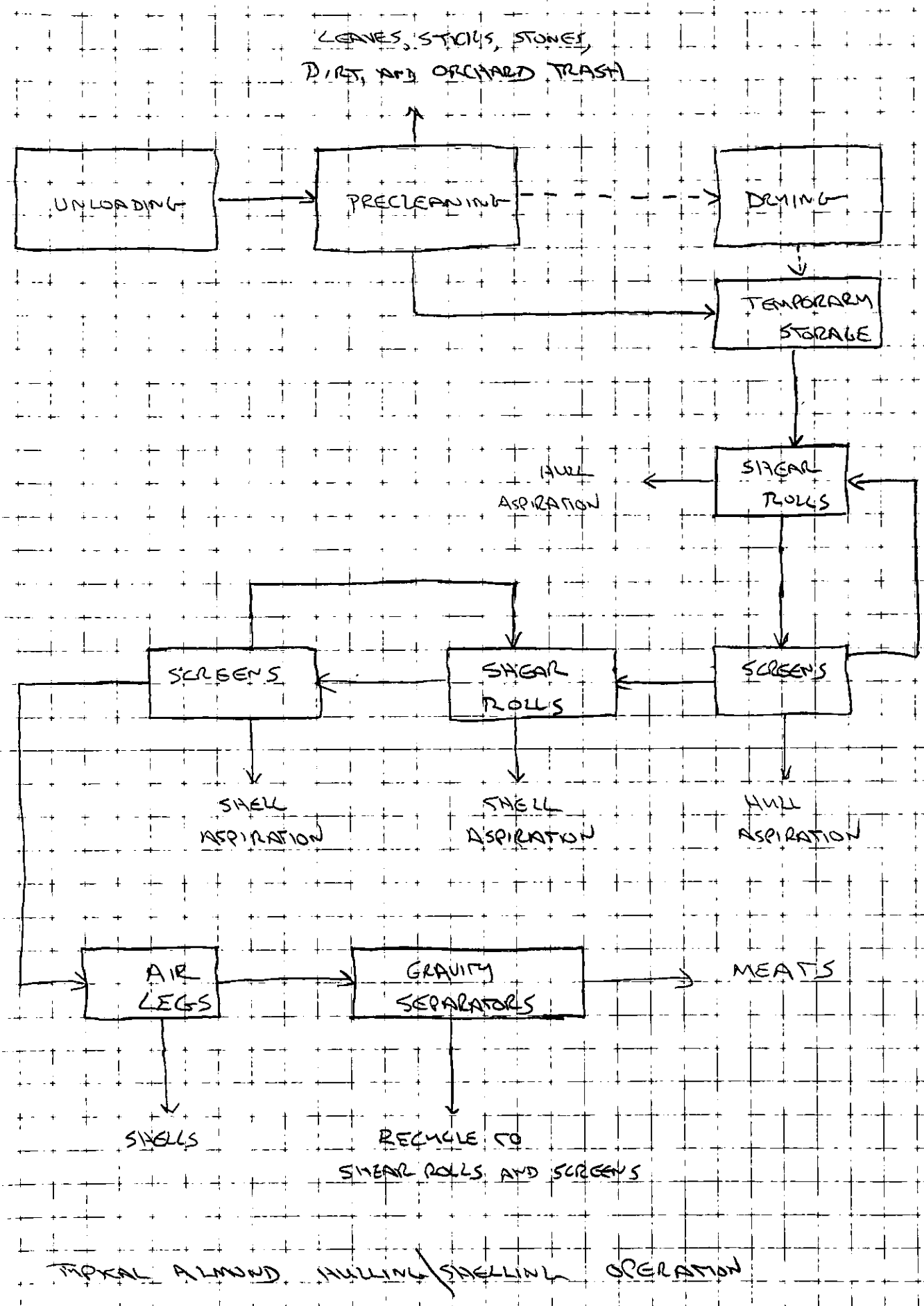


TYPICAL ALMOND HULLING OPERATION

4/601-08



TYPICAL ALMOND HULLING/SHELLING OPERATION

4601-08