AP-42 Section Number: **9.9.1**

Reference Number: **6**

Title: **Letter from Thomas C. O'Connor Of National Grain & Feed Assoc., To Dallas Safriet, USEPA, Research Triangle Park, NC**

November 1993

AP-42 Section 9.9.1
Reference 6
Report Sect.
Reference

National Grain and Feed Association

November 24, 1993

Mr. Dallas Safriet
Environmental Protection Agency
Emissions Inventory Branch (MD-14)
Research Triangle Park, North Carolina 27711

Dear Mr. Safriet:

The National Grain and Feed Association (NGFA) appreciates the opportunity to review the new draft Section 6.9.1, Grain Elevators and Grain Processing Plants, that is proposed as a supplement to AP-42, Compilation of Air Pollution Emission Factors. Since NGFA members are primary engaged in grain handling, we will focus our comments on those portions of the new draft supplement that relate directly to grain elevators. Our comments are divided into page-by-page and sectional analyses.

The NGFA is the national nonprofit trade association of 1,100 grain, feed and processing firms comprising 5,000 facilities that store, handle, merchandise, mill, process and export more than two-thirds of all U.S. grains and oilseeds utilized in domestic and export markets. NGFA member firms comprise the largest sector of U.S. agribusiness.

I. Section 2: Industry Description

a) On page 2-8, it is incorrectly stated that almost all of the grain grown in the United States is handled through grain elevators. In fact, only about 83%[1] of all corn, soybeans and wheat is handled by grain elevators. The remaining bushels are used directly on the farm as a feed.

b) On page 2-17, a more correct characterization of the receiving capacity of a country elevator would be to state that it ranges from 5,000 bu/hr to 15,000 bu/hr rather limiting the receiving capacity to 10,000 bu/hr or less. Furthermore, the size of trucks received at a country elevator is more commonly in the range of 300 bushels to 1000 bushels rather than 50 bushels to 300 bushels. To correctly characterize current truck unloading practices, in the third full paragraph, the third sentence should be changed to read "Straight bottom trucks are usually unloaded ..." And the following sentence, "Hopper bottom (Gondola) trucks are unloaded from the bottom of the truck," should be added before the last sentence.

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[1] *Transportation of U.S. Grains, A Model Share Analysis*, USDA-AMS, July 1992. Compared to USDA Supply-Demand Analysis.

1201 New York Avenue, N.W. Suite 830 Washington, D.C. 20005

The last paragraph on page 2-17 may leave the false impression that the bulk of grain received from the farm contains excessive levels of FM and will typically be cleaned. In reality, not every country elevator owns a cleaner (USDA's Economic Research Service reports that only approximately 67% of elevators handling corn own cleaners), and the economic incentive to clean may not be sufficient to justify cleaning. We would suggest the forth sentence of this paragraph be changed to read, "Country elevators may at times clean grain depending on market conditions, equipment availability and local crop conditions."

c) Figure 2-5 on page 2-18 suggests that various equipment entirely enclosed in an elevator structure are sources of particulate emissions (PM) to the environment. For example, the diagram suggests that internal leg casings, internal leg boot pits, reclaim tunnels, and internal scales and garners are sources of PM. Although each of the cited sources certainly has the potential to emit dust to the interior of the elevator, the likelihood of any of these sources emitting PM directly to the atmosphere depends on equipment and facility design. Clearly, an interior leg casing is not a source of atmospheric PM and the same is true of much of the other internal equipment identified on Figure 2-5. From that perspective, we think Figure 2-5 is misleading and recommend that any reference to PM emissions from interior operations be removed from the diagram.

d) The third paragraph on page 2-19 provides a correct but limited description of conveying equipment associated with annex storage. Although belt conveying is common, augers and drag conveyors are used in some instances. To recognize these alternative conveying methods, the third sentence should be changed to read, "Annex storage requires a gallery belt and "tripper" or some other form of conveyor to convey the grain from the discharge of the receiving leg to the annex storage bins, and a "tunnel belt", auger or drag conveyor beneath the bins to convey the grain back to the boot of the elevator leg."

e) On page 2-20, the second paragraph refers only to belt conveyors when discussing grain handling operations at terminal elevators. Although belt conveyors are the most common form of conveyor, drag conveyors, augers and direct spouting are frequently employed. The following sentence should be added after the first sentence in this paragraph, "Drag conveyors, augers and direct spouting may also be employed, particularly at newer facilities."

The third paragraph on page 2-20 leaves the false impression that all trucks unloading grain at a terminal elevator must rely on a hydraulic lift to unload. In reality, hopper bottom trucks, which unload directly into the receiving pit without the aid of a hydraulic lift, comprise a significant percentage of the trucks delivering grain to terminal elevators. To more accurately characterize grain receiving at today's grain elevators, the portion of the paragraph beginning "Trucks are typically ..." should be changed to read, "Trucks are typically driven into the shed, where some may be unloaded using a hydraulic lift platform. The hydraulic lift raises and tilts the truck to allow the grain to flow out the back, through the grate and into the receiving pit. Hopper bottom trucks unload directly into the receiving pit. The grain is transported from ..."

f) In figure 2-6 on page 2-21, we recommend the following changes and/or modifications: 1) Where practical, replace the word "belt" with the term "conveyor;" 2) Include a notation that equipment vents may be hooked up to aspiration systems; and 3) Indicate that elevators are not

designed with two headhouses and that this diagram is only for illustrative purposes.

g) Boxcars are no longer relevant to modern grain handling operations. Economics have made hopper cars the primary means of shipping grain by rail in today's grain handling industry. Therefore, the discussion of boxcars on page 2-22 should be eliminated.

h) On page 2-23, the fifth paragraph states that elevators cool grain by "turning" the grain during very cold weather. Although "turning" may be used to cool grain under unusual conditions, it is certainly not the most common way to condition grain and, for some grain, it is the least preferable practice. Modern grain handling practices employ aeration to cool grain. Aeration uses fans and ducts to blow cool air into or pull cool air through a mass of stored grain at very low airflow rates. The second sentence of this paragraph should be changed to read, "This cooling is accomplished by "aerating" the grain with cool air which is either blown into or pulled through the stored grain mass by using a series of ducts connected to fans."

i) On page 2-52, the first full paragraph states, "Truck shipments usually are unloaded through the rear tailgate after elevating the truck body 30 to 45 degrees." For non-selfdumping, straight bottom trucks this is true. However, the sentence leaves the false impression that the only trucks received at a processing plant are of this type. As we stated previously, there has been an increase in the percentage of hopper bottom trucks received at grain elevators and processing plants. This is important to recognize since, as the agency knows, unloading hopper bottom trucks results in significant reductions in emissions.

j) On page 2-54, the third sentence of the forth paragraph should read, "Micro-ingredients, such as trace minerals and drugs, are weighed on bench or floor scales.

k) On page 2-55, in the first full paragraph, the last sentence should read, "If pellets are to be made, the meal is conditioned with steam prior to being made into pellets." The first sentence of the next paragraph should also be changed to read, "Pellet making is an extrusion process in which conditioned meal is forced through dies." In paragraph beginning "If pellets are to be reduced in size ...," the following should be added to the end of the last sentence, "... which are recycled to the pellet process."

l) On page 2-56, the introductory paragraph suggests that grain dust is a health hazard. This is a very controversial subject among safety and health professionals. A recent study of 427 grain elevator workers concluded, "Comparison of the health of grain elevator workers with community and industrial data showed that the rates of chronic bronchitis and abnormal pulmonary function were not higher than usually encountered in other populations."[2] A more accurate statement would be, "Exposure to grain dust at levels above those permitted by current federal regulations may provoke a mild allergic reaction in some workers."

This paragraph also mentions volatile organic compounds (VOC's) as possible pollutants from grain elevators. We are surprised by this statement since we are not aware of any data

[2] Health and Hygiene, Inc., *Worker Exposure to Dust in the Grain Industry*, (Unpublished report on research, Greensboro, N.C. Sept 1991), pp. 1.

which shows that grain elevators are a significant source of VOC's. If the agency is referring the gas-phase VOC's mentioned in Reference 14, the agency should be aware that many of the chemicals discovered in that study were ingredients in fumigants which have been removed from the marketplace and can no longer be legally used at grain elevators.

In the listing of main PM emission points, it is misleading to imply that grain cleaning equipment, garner and scale bins, elevator legs and transfer points are always sources of atmospheric PM. Only if this equipment is vented to the atmosphere would PM emissions be an environmental problem. Typically, this equipment is located within the headhouse so any dust emissions from this equipment would tend to settle inside the facility. Additionally, the equipment is often connected to an aspiration system. In modern grain elevators, cleaners can be totally enclosed in dust tight housings. These pieces of equipment should be removed from the list of PM sources and the following sentence should be added at the bottom of the list, "Grain cleaning equipment, garner and scale bins, elevator legs and transfer points may also be sources of PM emissions if vented outside the grain elevator."

m) On page 2-57, the second full paragraph suggests that grain dust dispersed in the interior of the elevator consists mostly of particles "... measuring approximately 5 microns or less in diameter." This is incorrect. A recent study found that approximately 75% to 80% of dust particles inside an elevator are greater than 10 microns in size.[3] A more accurate characterization of dust emissions would be, "Grain dust suspended in the air in the interior of grain elevators consists mostly of highly dispersed particles measuring approximately 10 microns or greater."

To more accurately describe the explosion risk in an elevator, the last sentence of the second paragraph should be changed to, "Because of the high organic content of grain dust, concentrations above the minimum explosive concentration (MEC) for dust pose an explosion hazard. However, this situation is rarely encountered in work areas."

In the third and forth paragraphs on page 2-57, there are two areas that need further clarification. First, the discussion of dust collection techniques only mentions aspiration systems as a means to control dust emissions. This ignores the very significant contribution to reducing dust emissions of approved liquid additives, enclosed conveyors, choke feeding and other equipment and practices. Second, the discussion leaves the impression that elevator managers are concerned with fugitive emissions only if these emissions are inside the elevator. In our experience, elevator management is concerned with any fugitive emission and will take steps to reduce these emissions whenever and wherever they are found. Consequently, these efforts reduce both the explosion and the air pollution problems simultaneously. Additionally, re-suspension of dust is unlikely under normal operating conditions and is not a credible source of PM emissions.

n) On page 2-58, the first sentence of the forth full paragraph should be changed to read, "The dust-laden air, which may be emitted by some truck unloading operations, results from the

[3] Ibid., Tables 3-12 and 3-13.

displacement of air out of the receiving pit." The following sentence should be added to the end of this paragraph, "Unloading grain from hopper bottom (gondola) type trucks results in a significant reduction in dust emissions because of the choke condition of the grain flow into the receiving hopper."

o) On page 2-59, the following phrase should be added at the end of the partial paragraph at the top of the page, "... motorized door on one end or a shroud around the hopper discharge."

The second paragraph discussing box car unloading is unnecessary. As discussed previously, boxcars have been virtually replaced by hopper cars in the movement of grain.

p) On page 2-62, in the second full paragraph, the second sentence should be changed to read "Both types of systems may generate substantial quantities of PM depending on the design and extent of the enclosure." This is a more accurate description of the wide range of grain dryer designs that can be found at domestic grain elevators.

The third full paragraph leaves the false impression that scales and garners are always sources of dust emissions. In reality, many elevators provide a common duct for both pieces of equipment to provide a path for the displaced air. Also, most scales are enclosed and not open.

q) On page 2-63, the following should be added to the end of the sentence at the top of the page, "... or fabric filter."

r) On page 2-73, the opening paragraph of Section 2.4, Emission Control Technology, states that there are only two types of dust control technology: process modifications that are designed to either prevent or inhibit emissions, and capture/collection systems. Table 2-11 identifies the types of controls available for each source. Surprisingly absent from this discussion is any mention of approved liquid suppressants. The reader has to wait until page 2-79 for a discussion of this technique. We recommend that liquid suppressants be noted on Table 2-11 with respect to receiving operations, belt conveyors, elevator legs and shipping operations where liquid suppressants may be applied to effectively suppress dust.

s) On page 2-75, we suggest that the following be added to the end of the first full paragraph, "Lastly, several different types of devices, when added to the end of a spout, are available to slow the grain flow and compress the grain discharge stream. By doing so, the dust remains entrapped with the grain stream with a significant reduction in PM emissions."

II. Section 4: AP-42 Section Development

a) On page 4-10, reference 14 notes the presence of several gas-phase Hazardous Air Pollutants (HAP's) resulting from the use of fumigants. The HAP's listed are 2-Butanone, carbon tetrachloride, carbon disulfide, ethylene dibromide, ethylene dichloride, methyl alcohol and phosphine. The vast majority of these chemicals can no longer be legally applied to grain. Of those noted, phosphine gas is the only legally registered fumigant and is the predominant fumigant in use today to control insects in stored grain. Methyl bromide is occasionally used

but it is rapidly being phased out due to concerns over its ozone depleting potential in the upper atmosphere.

b) In reviewing Section 4.3.3 (Candidate Emission Factors), we are concerned about several methods and assumptions used to develop candidate emission factors. First, in developing emission factors for country elevators, the agency averages in test data for emissions related to dry edible beans (i.e., lentils and peas) with emission data for the major grains handled at grain elevators, as if production of dry edible beans was comparable to wheat, corn, soybeans, and sorghum (i.e., the major commodities being handled by grain elevators). This is clearly a very erroneous assumption. For example, in 1990, 2.1 million acres of U.S. farmland were devoted to dry edible beans. In the same year, 66.9 million acres were devoted to corn, 56.5 million acres to soybeans, 69.4 million acres to wheat and 9.1 million acres to sorghum. Furthermore, production statistics show that dry edible beans are not grown in Iowa, Illinois, Indiana, Missouri, Ohio and several other major grain growing states. Thus, the inclusion of emission data for dry edible beans with data for wheat, corn, soybeans and sorghum in the calculation of emission factors for certain elevator operations is, in our view, totally inappropriate. We have no objection to the agency providing emission data for dry edible beans in a supplemental table in AP-42. However, these data should not be considered when developing emission factors for various grain handling operations at a typical grain elevator.

Second, candidate emission factors are developed and presented in Table 4-20 for several internal grain handling operations. For example, emission factors are presented for Headhouse and Internal Handling, Grain Cleaning, and Belt Transfer. Developing emission factors for these types of operations implies that moving grain internally within a grain elevator presents an environmental pollution problem, when in fact dust emissions related to these operations are a problem for internal housekeeping and safety only. More precisely, these emission factors assume that dust emitted from equipment inside the facility makes its way to the outside regardless to the location of the equipment and design of the facility. In reality, the vast bulk of any dust emitted by equipment settles on nearby equipment. Therefore, if these emission factors are retained in AP-42, state officials are likely to use them improperly, with the result that emissions from a grain elevator may be wildly overestimated, particularly for fee purposes. Furthermore, the summaries provided in Chapter 4 of references 23, 24, 25, 26, 27, and 40 state that dust measurements were made upstream of the dust control systems, i.e., a cyclone dust collector. In other words, it appears that the report assumes that dust going to a dust collection system represents the dust that would be emitted to the atmosphere in the absence of no dust control system. We challenge this assumption and method for determining emissions from internal grain handling operations for two reasons. First, as we have previously stated, any dust emitted from internal grain handling operations will quickly settle on nearby equipment, floors and ledges. Second, this method seems likely to overstate the amount of dust that can reasonably be expected to be emitted to the interior of the elevator from some pieces of equipment, e.g., grain distributors and scales, because negative pressure is being applied to the equipment to pull all dust being generated inside the equipment. Under uncontrolled conditions, the same equipment would be expected to only emit dust to the interior of the elevator from seals and seams that are not dust tight. Given the lack of either testing data measuring or realistic assumptions regarding actual emissions of internal grain handling operations to the atmosphere, the emission factors for internal grain handling operations should be deleted from AP-42.

Third, the agency relied on a computer simulation program, SPLIN2, to develop size distribution data for grain dust emissions for receiving and shipping at terminal and export elevators. The particle size ranges selected were 2.5 through 30 microns. The computer simulation calculated that average PM-10 emissions (particles with an aerodynamic diameter less than 10 microns) for grain receiving are 48% of total dust emissions when controls are present and 55% of total dust emissions when no controls are present. For shipping, the computer simulation estimated that PM-10 emissions are 38% of total emissions when no controls are present. **We do not agree with these theoretical figures.** In reality, PM-10 emissions are a much smaller fraction of total dust emissions. The following studies, which looked at the health and safety aspects of grain dust, provide important and credible information on the particle size distribution of grain dust. They show that PM-10 emissions range between 5% and 29.8% of total dust emissions.

A. The following tables were taken from *Worker Exposure to Dust in the Grain Industry*, Health and Hygiene, Inc. Sept. 1991 - see tables 3-12 and 3-13.

TABLE 1

Percentage of grain dust less than 10 microns in aerodynamic diameter by industry segment.

	No. Samples	% less than 10 microns Mean
Country Elevator	26	19.7
Terminal Elevator	23	23.9
Export Elevator	10	26.0

TABLE 2

Percentage of grain dust less than 10 microns in aerodynamic diameter by type of grain handled.

	No. Samples	% less than 10 microns Mean
Corn/Soybeans	28	17.8
Wheat	15	29.8
Both	4	21.6

B. The next two studies suggest that even these percentages may be too high:

1. Stockham, J., and Rajendran, N., *Establishing a Reliable Grain Dust Measurement Technique for the Bucket Elevator,* 1984. Data presented in Chapter 3 shows that particulate equal to or smaller than PM-10 constitutes 10%-18% of total dust (see figures 10 and 11).

2. Parnell, C., et. al., *Grain Dust Explosion Hazard*, 1984. This study presents particulate size histograms for different types of grains, and suggests that even the numbers in Tables I and II represent an overestimate of the percentage of PM-10 in total dust. For example, Figure 4 states that PM-10 is only 5.4% of total wheat dust, Figure 5 states that PM-10 is only 6.2% of total wheat/sorghum dust, and Figure 7 states that PM-10 is only 10.3% of total soybean dust.

In summary, the data in Tables I and II and the research reports listed above should be used rather than computer simulations to calculate PM-10, as the data above contain actual grain dust measurements.

Lastly, when considering the sum of the candidate emission factors and the emission factors with handling ratios considered, the data are unrealistically high, given actual operating experience of NGFA member companies. For example, in table 6.9.1-4, the total emission factor for country elevators is 11.743 lbs per ton, for inland terminal elevators is 7.37 lbs per ton and for export elevators is 5.31 lbs per ton. But, an informal survey found that, based upon experience, grain company's expected normal loss in grain handling is generally in the range of 0.15% to 0.20%, or 3 to 4 lbs per ton. Since the normal expected grain handling loss would not only include emissions of dust to the atmosphere but also losses due to waste (e.g., leakage, spoiled grain and collected dust that is not added back to the grain stream), deterioration due to quality loss, and any other unaccounted for loss in weight due to handling grain, there is something obviously wrong with the figures in table 6.9.1-4. Quite simply, economic pressure compel elevators to minimize weight loss throughout the grain handling operation. The weight loss implied by the candidate emission factors would be economically unsustainable in today's competitive marketplace.

III. Proposed AP-42 Section 6.9.1

a) In section 6.9.1.1, the description of grain handling operations is generally correct. However, we recommend that the following be substituted into the third paragraph of this section for everything after the sentence which ends with the phrase "... extended down into the hold."

> "The main building at an elevator, where grain is elevated and distributed, is called the "headhouse." In this area, grain is lifted on an elevator leg (some newer facilities do not use legs but elevate grain using inclined conveyors) and discharged onto conveyors, which move the grain to storage bins. This area of the facility is usually referred to as the bin deck or gallery. Typically, belts are used in this area, employing a tripper to divert the grain into the desired bin. Newer facility designs have employed drag conveyors to move grain to storage, avoiding the need to install costly dust control systems to control the emissions associated with the tripper. Direct spouting to bins is also common. Grain may be cleaned, dried and cooled for storage. For shipping, grain is discharged from bins onto a conveyor, which moves the grain to a scale garner and on to the desired loadout location. Grain may also be cleaned during loadout, depending on equipment availability and market requirements. Figure 6.9.1-1 illustrates the basic elements of an export terminal elevator."

b) In section 6.9.1.2, the opening paragraph contains a few factual errors that should be corrected. First, it incorrectly states that "(g)rain-derived dusts, when inhaled, provoke allergenic reactions by many people ..." As we mentioned previously, a recent study involving 427 grain elevator workers found that their health compared favorably with the general population. This study also found, as have other studies, that the predominant influence on the health of workers exposed to grain dust was the prevalence of smoking. To more accurately describe the health risks of exposure to grain dust, the above sentence should be changed to read, "Exposure to grain-derived dusts above federally prescribed levels may provoke a mild allergenic response in some workers not wearing proper respiratory protection and in ..."

Second, the opening paragraph states that particulate emissions from some dryers may contain quantities of heavy metals listed as Hazardous Air Pollutants (HAP's) in the 1990 Clean Air Act Amendments. The report claims that particulate emissions from grain dyers <u>can</u> contain trace quantities of chromium, manganese, and nickel. In the second paragraph of this section, it states that grain elevators and processing plants can also generate various gas-phase HAP's. We question the validity of both statements.

1. We are shocked by the statement that grain dyer emissions may contain trace elements of certain heavy metals. We are not aware of any research which establishes grain dryers as a source of heavy metal particulate emissions. Furthermore, the statement seems to be based upon tests of a rice dryer in 1979. Without credible data showing that dryers at grain elevators are a source of these emissions, the reference to heavy metal particulate emissions should be removed from the document for the following reasons: 1) It clearly mischaracterizes grain dryer emissions, and 2) It may encourage state permitting officials to impose unnecessary testing and permit fees on grain elevators.

2. As we mentioned previously, except for phosphine, all of the gas-phase HAP's mentioned in the second paragraph are related to fumigants which can no longer be legally used to fumigate grain. The predominant fumigant that can be legally used today at grain elevators is phosphine gas. The agency should either remove reference to the other chemicals or note that, except for phosphine, the vast majority of these chemicals have been removed from the marketplace and are unlikely to be emitted from grain elevators and processing plants.

In the fourth paragraph of this section, the agency discusses the use of handling ratios to help determine emissions from a facility based upon amounts of grain shipped and received. In our opinion, these handling ratios (as presented in Tables 6.9.1-3 and 6.9.1-4) have very little meaning, primarily because elevator operations are so variable from year to year and operating practices have changed in the 20 years since the initial research was done by EPA. For example, we do not believe that elevators turn grain stocks an average of 3.1 times per year (or 3.0 for Inland terminal elevators and 2.2 for export elevators), because unnecessary turning will reduce the economic value of grain, and there are more effective ways to condition grain, e.g., aeration. The 2.1 bin loading ratio for country elevators (along with the 2.0 for tunnel belts and

1.7 for gallery belts at Inland terminal elevators) also seems excessive. As we mentioned, all grain elevators avoid turning stocks unless absolutely necessary; a more accurate figure would be close to 1.0. Importantly, the agency itself recognizes that the handling ratios may have little meaning in the "real world." Specifically, the agency states "... because operating practices at individual elevators are different, these ratios, like the emission factors themselves, may lack precision when applied to an individual elevator."

Furthermore, these averages continue the misconception that interior grain handling operations result in emissions to the atmosphere. As we have discussed previously, this misconception can lead to gross overestimates of emissions and unfair economic penalties for many grain elevators. For this reason and the ones stated in the previous paragraph, we believe that emissions should be based upon actual grain handled, cleaned and dried. The agency should remove these averages from Tables 6.9.1-3 and 6.9.1-4 in the revised AP-42.

In the first and second paragraphs on page 6.9.1-26, the agency is to be complimented for adding a discussion of the use of food grade oil as a means of controlling dust emissions in the revised AP-42. However, the statement in the first paragraph that the Food and Drug Administration (FDA) currently restrict application rates of soybean oil to 0.01 percent by weight is incorrect on two counts. First, the FDA has not set a maximum limit on the amount of soybean oil that can be applied to grain destined for human consumption. The agency has only set a maximum limit on the amount of food grade mineral oil that can be applied to grain destined for human consumption, which the report correctly identifies as being 0.02 percent by weight. Second, the successful use of food grade vegetable oil to suppress dust emissions is not limited to soybean oil. Other vegetable oils can be and have been used with equal success to suppress dust emissions. To correct these errors, we recommend that the second and third sentences of the first paragraph be changed to read: "An alternative control measure that has developed over the past 10 years is dust suppression with food grade mineral and vegetable oils. Currently, the Food and Drug Administration restricts application rates of mineral oil to 0.02 percent by weight."

Furthermore, the comment in the second paragraph that no data has been published on the efficacy of oil additives is incorrect. The study *Examining the Use of Additives to Control Grain Dust* by Fang S. Lai, et al reported on the results of tests showing the effectiveness of additives to control grain dust. The percentages of dust reduction from the use of oil additives quoted in this paragraph are in line with the results obtained in the above study. We have included a copy of the study for your use.

In the fourth paragraph on page 6.9.1-26, there is a brief discussion of control devices that may be installed on grain dryers. The type of control devices mentioned are accurate but the paragraph fails to recognize screen size as another way dryers can comply with existing air pollution regulations. At grain elevators meeting current New Source Performance Standards (NSPS) criteria, EPA has ruled that column dryers with a column plate perforation not exceeding 0.094 inch diameter (2.4 mm) or a rack dyer which passes exhaust gases through a screen filter coarser than 50 mesh are in compliance with the zero percent opacity requirement (40 CFR part

60, subpart DD, Standards of Performance for Grain Elevators).

IV. Tables 6.9.1-1 through 6.9.1-4

Consistent with previous comments, we have the following recommendations regarding Tables 6.9.1-1 through 6.9.1-4:

a) Do not use theoretical calculations which overestimate PM-10 emissions from grain elevators when actual test data is available to support more realistic levels. For example, the PM-10 emission factors for receiving and internal handling seemed based upon actual testing and should be retained. For other emission factors, rather than relying on theoretical computer generated figures (i.e., SPLIN2), the agency should incorporate the results of actual testing presented in the three reference documents attached to this letter. This information can be presented in Tables 6.9.1-1 and 6.9.1-2 and in the footnotes to Tables 6.9.1-3 and 6.9.1-4. (There appears to be one typographical and one calculation error in Table 6.9.1-2. Regarding the apparent typographical error, the table reports that filterable PM emission factor for a column rice dryer is 0.013 lbs per ton. We think the correct figure is 0.13 lbs per ton. Regarding the calculation error, we think the emission factor for grain receiving at inland and export elevators for mixed grain with no control should be 0.90 lb/ton rather than 0.71 lb/ton.)

b) Do not combine emission data for dry edible beans (lentils and peas) with emission data for wheat, oats, soybeans, sorghum and corn in Tables 6.9.1-3 and 6.9.1-4. The amount of dry edible beans handled by grain elevators is insignificant when compared to the other grains mentioned. After eliminating emission data for dry edible beans, the emission factor for receiving grain at a country elevator would be changed from 3.4 lbs per ton (1.7 kg per Mg) to 0.065 lbs per ton (0.082 kg per Mg). However, we are concerned that this revised emission factor may lack credibility since AP-42's existing emission factor of 0.6 lbs per ton (0.3 kg per Mg) and the emission factor for terminal elevators will also be higher. Therefore, we recommend that the agency retain the current emission factor for grain receiving at country elevators of 0.6 lbs per ton (0.3 kg per Mg).

c) Do not combine emission factors for rack and column dryers. As the agency recognizes on page 6.9.1-26, the majority of dryers at grain elevators are column dryers, so averaging emissions of both types of dryers together is inappropriate. Importantly, since rack dryers emit more particulate matter, a combined figure will grossly overstate "typical" emissions from a grain elevator and severely penalize those elevators which own a column dryer. Each dryer should be reported separately in Tables 6.9.1-3 and 6.9.1-4.

d) Do not report emission factors for internal operations. As we have discussed, the information is based upon faulty logic and not measurements of actual PM emissions to the atmosphere. Importantly, as they are currently presented in tables 6.9.1-1 through 6.9.1-4, emission factors for internal operations, i.e., bin loading, cleaning, headhouse handling, and tunnel and gallery belt transfers, have great potential to be easily misapplied by state permitting officials to overstate potential and actual emissions from grain elevators. As we have stated

previously, internal grain handling operations may emit dust to the interior of the elevator but will not be a significant source of PM to the atmosphere.

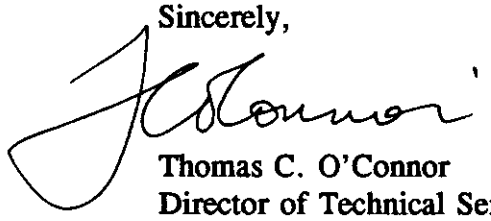
e) Eliminate the column entitled "Typical ratio of grain processed to grain received or shipped" in Tables 6.9.1-3 and 6.9.1-4. These data have very little meaning but can be misused by state permitting officials. As we have previously mentioned, the amount of grain turned has changed dramatically over the past 20 years due to widespread use of aeration. Furthermore, the amount of grain cleaned and dried is influenced by several factors, including the grain itself, market conditions and weather, which vary by region and the natural year to year variation in environmental conditions. In reality, the only handling ratios that possess any degree of reliability are the ones for shipping and receiving, i.e., 1.0. As we noted previously, the amount of loss suggested by the sum of the emission factors (either taken by themselves or with handling ratios considered) is not credible when compared to the typical handling weight loss experienced by grain elevator managers.

V. Conclusion

With the passage of the 1990 Amendments to the Clean Air Act, AP-42 has taken on a more prominent role in determining emissions from grain elevators. Specifically, the information in this document is being used by state permitting officials to estimate grain elevator emissions and asses fees for those estimated emissions. It is important that information contained in this document be reflective of current grain handling practices, incorporate actual data where available, and avoid inappropriate emission factors (such as those related to internal operations).

Thank you for the opportunity to review the revised section to AP-42. If you would like to discuss these comments further, please feel free to call me at 202-289-0873.

Sincerely,



Thomas C. O'Connor
Director of Technical Services