ILLINOIS POLLUTION CONTROL BOARD
April 12, 1973

ENVIRONMENTAL PROTECTION AGENCY	)	
	)	
v.	)	
	)	#72-188
ASHLAND CHEMICAL CO., A DIVISION OF ASHLAND OIL, INC. AND LONZA, INC.	)	

LARRY A. EATON, ASST. ATTORNEY GENERAL, ON BEHALF OF ENVIRONMENTAL PROTECTION AGENCY
JAMES W. GLADDEN, JR., MAYER, BROWN, & PLATT, ON BEHALF OF RESPONDENT, ASHLAND CHEMICAL COMPANY
MICHAEL O. GARD, OF SWAIN, JOHNSON & GARD, ON BEHALF OF RESPONDENT, LONZA, INC.

OPINION AND ORDER OF THE BOARD (BY SAMUEL T. LAWTON, JR.):

Complaint was filed by the Agency against Respondents, Ashland Chemical Company, a Division of the Ashland Oil Company, Inc. ("Ashland") and Baird Chemical, a division of Lonza, Inc. (subsequently amended to Lonza, Inc., hereafter "Lonza"), alleging that between July 1, 1970 and July 12, 1971, and in particular on 31 specified dates and continuing to the date of the filing of complaint, being May 1, 1972, Respondents have, by their operations, "either alone or in combination with other sources, caused or threatened to allow the discharge or emission of contaminants into the atmosphere so as to cause or tend to cause air pollution in Illinois in violation of Section 9(a) of the Environmental Protection Act." (Ill. Rev. Stat., Ch. 111-1/2, Sec. 1009(a), 1970). Respondents' plants are contiguous and located in the vicinity of Mapleton, Peoria County.

The many facilities within the Mapleton area are delineated on Respondent Ashland's Exhibit #51. The Ashland and Lonza facilities lie closest to Mapleton, approximately 1/2 mile south-southeast. Slightly further away is the Caterpillar plant, lying south-southwest. Mapleton Industries is located over 1 mile northeast of Mapleton. Other plants within the area are located further away. The Cilco power plant at Hollis is over three miles northeast of Mapleton. The Powerton power plant is located over three miles

southeast of Mapleton. The plants of Archer-Daniels-Midland and Corn Products Corporation are over three miles east-southeast of Mapleton.

Respondents' facilities are located in Peoria County within or adjacent to the corporate limits of the municipality of Mapleton, between Route 24 and the Illinois River. The plants are located on a private body of water, known as Pond Lilly Lake, which separates Respondents' plants, on the south, from the Illinois River. The municipality lies across the highway, several hundred yards north and northwest of the plants (R. 1254 and Ashland Ex. 1 & 8). The Ashland facilities were constructed in 1961, and were originally owned by Archer-Daniels-Midland Company (R. 1083). Ashland acquired the facilities approximately 6 years ago (R. 1084). The Lonza facility was constructed shortly after the Ashland plant by Baird Chemical Company which was merged into Lonza, Inc., before the initial date of the alleged violations (R. 1254).

The Ashland plant produces a wide variety of chemical products. The evidence indicates that Ashland uses materials including beef tallow, coconut oil and certain animal and vegetable oils to make its products including fatty acids, alcohols and nitriles, polyester plasticizers, amides and primary, secondary and tertiary amines and quaternary amines for a wide variety of uses, including cosmetics, drugs and fabric softeners (R. 1082-1083, EPA Ex. 10 and Ashland Ex. 63). The plant's facilities include reactors, vacuum stills, fractionation columns, pressure vessels, storage tanks and hydrogen manufacturing facilities (EPA Ex. 12, 27, and 28). Additional facilities include an ammonium handling system, wastewater treatment system and steam production system (EPA Ex. 10). Steam production facilities consist of two coal-fired boilers and one gas-fired boiler. (EPA Ex. 10). The wastewater treatment facilities begin with "hot-wells" (reservoir), from which wastewater proceeds through channels to air flotation separators, or "grease flotation clarifiers" and then to an extended aeration pond, settling pond, an 18-1/2 acre lagoon and finally, to a 105 acre closed lagoon. Most of the water is recycled from the settling basin back to the plant to be used as cooling water (EPA Ex. 10, Ashland Ex. 19).

It is important to associate the descriptive identification of odors with the chemical compounds responsible. The following list identifies by-products and compounds manufactured by Ashland with the common description of their odor.

Compounds	Description
Amines	Fishy
Hydrogen sulfide	Rotten eggs
Liquid fatty acids	Sour, rancid
Ammonia	Pungent

The amines and fatty acids are produced at Ashland while ammonia is used as a raw material and hydrogen sulfide results from the septic conditions in the wastewater treatment lagoons.

The sources of odorous emissions at Ashland can be divided into the following three areas; process facilities, waste water collection and treatment system, and the steam generation system. In terms of severity of odor emissions, the waste water collection and treatment system are the worst offenders.

Emissions from the process facilities during normal operation reach the atmosphere directly through excess hydrogen vents associated with the hydrogenation processes (EPA Ex. 1), and through vents on storage tanks during loading operations (EPA Ex. 12). Emissions from the processes reach the atmosphere indirectly through the waste water collection and recovery system in that steam ejector discharges and scrubber wastes in most cases empty into the various hot wells (Ashland Ex. 63). A less significant source of emissions would be the glycerine and ammonia recovery systems (EPA Ex. 28).

Emissions from the processes can only result from abnormal conditions due to the many safety valves and burst diaphrams required (EPA Exhibit 12).

The wastewater collection and treatment system handles most of the byproducts and wastes from the process facilities and thus all the various odorous substances produced including fats and oils, fatty acids and alcohols, and the various amines and esters (Ashland (Ex. 63). The hot wells, the first step in the collection process, have been observed to have floating fats and oils, to emit visible vapors, and to emit various odors including those characterized as fishy and rancid (EPA Ex. 10). The open channels (actually covered by boards) had fishy odors (EPA Ex. 10). The floatation cells from which grease and bouyant materials are skimmed, have been observed to emit greasy, rancid, hydrogen sulphide, and in general, putrefying odors (EPA Ex. 10). The aerated lagoons apparently are a major contributor to the odor and have been described as emitting a reprehensible combination of various odors such as rancid, putrefying, fishy and hydrogen sulfide (EPA Ex. 10). The conclusion drawn was that the floatation system was overloaded so that excess organic matter was discharged to the aerated lagoon which, because of inadequate mixing and oxygen supply, was septic with stagnant regions of decomposing organic materials (EPA Ex. 10).

A third source of odor is the steam generating plant. In addition to coal and gas, skimmed grease from the floatation cells (EPA Ex. 10) and process residues including fatty acid varieties, are burned in the furnaces (EPA Ex. 28). Combustion gases exhausting out the stack could then include odorous combustion products.

The Lonza plant is used primarily for the production of a sugar solution known as Sorbitol, constituting 65% of its plant production. The remaining production is essentially alkyl chloride, tertiary and quaternary amines used in deodorant and germicidal applications (Lonza Ex. 1, EPA Ex. 26, 10). Lonza uses chlorination, reaction, evaporation and quaternarization processes in creating these products, which require the use of pressure tanks, water scrubbers, vacuum stills and surface condensors (Lonza Ex. 1). Lonza also has a wastewater system consisting of "hot-wells", effluent ditch, covered clarifier, covered settling tank recycle system, including a cooling tower, and two one-acre closed receiving lagoons (Lonza Ex. 1, EPA Ex. 26).

Odor emissions result from both the process and wastewater treatment and reuse facilities. Of the three main products, sorbital, nitrogenous compounds and alkyl chloride, the Sorbitol process probably does not result in significant emissions although it is possible to detect a caramel candy type odor near the process facility (Lonza Ex. 1).

In the production of amines and alkyl chlorides, substances including chlorine compounds, DMA and fatty compounds are emitted directly or indirectly to the atmosphere. The direct emissions result from atmospheric vents on the storage and holding tanks for the amines which are splash loaded (EPA Ex. 26). The byproducts and waste products such as hydrochloric acid gas (HCl), fatty alcohols, and DMA are removed from the processes by scrubbers which discharge either to the hot well or the effluent ditch (Lonza Ex. 1) from which emissions to the atmosphere can occur. The chlorine compounds frequently have a blue or greyish tint when emitted and acids such as HCl have an acrid odor and a burning sensation (EPA Ex. 10). Of the two water reuse systems, the "dirty" water system takes water from the amine production facilities, passes it through a floatation tank where organics are skimmed, and then through a cooling tower before reuse (EPA Ex. 26). The floatation tank and cooling tower probably emit odors.

The wastewater treatment lagoons appear to be in good shape. Recent evidence shows that the lagoons are aerobic with no emission of hydrogen sulfide (Lonza Ex. 1).

Before discussing the merits of the case, it is necessary to dispose of the procedural issues raised by Respondent Ashland. Ashland argues:

> "Unless there is identification of the nature of the odor on a specific day, it is impossible for Ashland to prepare a defense. This was recognized in Environmental Protection Agency v. Mystik Tape, #72-180, and Environmental Protection Agency v. George Rosenbalm, #71-299..." (Ashland Brief)

Respondent misconstrues the clear intention of the Board's statement. The statement quoted from Mystik Tape was directed to preclude open ended assertions of future violations "to the close of the record" without ultimate specification of violations before hearing and proof. No such situation maintains here where the complaint alleges that "since July, 1970 (in particular on 31 specified dates) and continuing to the present date" certain violations were committed by Respondent. In the Mystik opinion, we stated:

> "This does not foreclose some latitude in the showing of continuing violations for purpose of imposition of penalties or promulgation of abatement program. Likewise, while we do not look with favor upon generalized allegations of violations covering a specified period of time, as distinguished from detailed specifications of alleged offenses, such method of pleading is not fatally defective if it related to a period of the past."

Where the violation is a continuing one, Complainant need not allege and prove every date of the violation. Here, Complainant has alleged violations on over thirty specified dates and has offered proof of those dates, as well as on other dates to show the continuing nature of the violations. There was no attempt to allege or prove violations outside the scope of the complaint. Proof has been offered on other dates which is properly admissible since it was offered to show the failure of either Respondent to effectively abate its odor emissions and the nuisance resulting therefrom, after the period of alleged violation. The Mystik caveat was directed specifically to cases where proof was offered of violations occurring subsequent to the date the complaint was filed or hearing commenced. Respondents do not assert that they were not apprised of the basic nature of the offenses charged in the complaint for the period involved. The situation calling for

the application of the Mystik rule is not present in the instant case where proof of violation is based essentially on the period pleaded in the complaint.

Respondents are jointly charged with causing or tending to cause air pollution either alone or in combination with other sources. The complaint alleges that Ashland air pollution results from two principal sources: first, its processing emissions, including production of amines, fatty organic oils, fatty quaternary ammonium chloride, and hydrogen sulfide; and secondly, its abatement processes consisting of skimming, burning, entrainment and aeration ponds. The complaint against Lonza centers on its process emissions in the production of tertiary and quaternary amines.

The case presents an issue of alleged severe odor nuisance from noxious odors, particularly to residents of Mapleton and visitors. The nature and extent of the purported violations will be examined in terms of the following characteristics:

1. Characteristics of the odors (as to smell and visual appearance);

2. Manner of transmission;

3. Duration of the episode;

4. Direction of the wind;

5. Establishment of the source of the odor;

6. Effect of the odor.

Understandably, citizens who testified during the hearings did not exhibit a uniform capability of distinguishing and identifying the odors involved. The majority, however, were able to distinguish a wide range of odors and associate them with various manufacturing and commercial operations in the vicinity. Two predominant odors were associated with Respondents' plants: one was a "fishy" odor, and the other was a "rotten egg odor". (R. 12, 61-62, 70-71, 72, 79-80, 99-100, 118, 141, 376-77, 378, 385, 391, 392, 445, 517, 532, 534, 538, 604). The witnesses identified other odors, some of which were associated with the Respondents' operations and others which clearly were not. These odors were characterized as sulfur, dead rats, lacquer and paint smells, tallow, anti-freeze, septic tank, "dirty pond smell", stale malt and ammonia. Fog or smoke emissions often accompanied the odors from one or both plants. (R. 12, 26, 34, 57, 58, 60, 73, 99-100, 114, 118 141, 142, 156, 157, 160-1, 178-9, 197, 200, 207, 221-2, 228, 243, 246-7, 256, 280, 282, 284-5, 296, 299, 302-3, 305, 308, 327, 335-6 342-43, 345, 346, 348, 376-7, 378, 385, 391, 392, 395, 397, 398,

425, 445, 517, 624, 527, 532, 537, 538, 549, 592, 593, 606, 611, 741, 742, 762, 829, 831, 833, 835, 838-9).

One resident was Dr. Richard Hoffman, a Professor of Chemistry at Illinois Central College. He holds degrees in chemistry and chemical education, and has had a number of years' experience in the analysis of fats, fatty substances and derivatives (R. 137-38). Many of the products produced by the Respondents fall within these categories. Dr. Hoffman resides about five miles from Respondents' sites and even at that distance, is affected by the odors (R. 140-141). He described the odors as "fishy" and "sulfur-like" (R. 141) and frequently travels by Respondents' plants to which he attributes their source (R. 140-141, 158, 168). At his house the odors are just "offensive" but in the vicinity of the plants he describes them as "malodorous" -- tending to make one ill (R. 168-70). He characterizes the odors as "typical of those in rancid fats, both animal and vegetable, and to nitrogenous derivatives thereof...they smell like fatty amines, tallow, oxidized tallow, soybean oil, fatty alcohols, glycerides, nitriles, quaternary amines..." (R. 156). On cross-examination, Dr. Hoffman stated that the "rotten egg smell...could easily come from the oxidation that's occurring in these clarifying ponds or whatever they are called out in back of the two plants in question..." (R. 192).

Witnesses were in general agreement that odors were more frequent during the summer than during the winter. In the winter months, the wind is predominantly from the north which would explain the decline in odor episodes, remarked upon by almost all of the witnessess (R. 76-7, 294, 344, 444). Testimony indicated that during spring, summer and fall, noxious odors were present on approximately half of the days (R. 387, 444). The predominant odors were present only when the wind was from a southerly direction (R. 211, 302-3). The days when odors were present were not necessarily days when the odor lasted for the duration of the day (R. 77-80). An odor episode could last anywhere from minutes to hours (R. 257-8). An hour or two appeared not unusual. The intensity was often greater at night. The odors can be detected at least five miles away on some days (R. 168-9). There has been no improvement in abatement of the frequency or pungency of the odors during the years in question (R. 291-2, 293, 352).

Whether taken in whole or in part, the record is consistently clear that the residents identify their odor problems as emanating from the Ashland and Lonza plants. There is overwhelming evidence that the residents identify Respondents' plants with producing noxious odors (R. 20, 120, 158, 204, 205, 247, 308, 408, 415, 422). The fishy odors are more commonly identified with Lonza's facilities and those of rotten eggs are more often attributed to Ashland Chemical, as will be described below. It is also clear that, though the residents have some specific ideas as to what is the source of

particular odors, the plants have presented problems in identification. These problems include the close proximity of the structures, and some similarity in their processes. We find that the citizens could easily differentiate other odors in the vicinity including those of foundries and anti-freeze manufacturing plants (R. 23, 242, 300-1, 311, 374, 389, 400, 537).

The effects of the odors, particularly the primary odors previously identified, have been sufficient to establish a violation of S ction 9(a) in terms of nuisance and interference with enjoyment of life and property. Some of the odors caused burning eyes (R. 13) and headaches (R. 102). The odors are also responsible for loss of appetite, inability to sleep and respiratory difficulties (R. 25). At least one individual became nauseous (R. 294), another stated that the odors made him irritable (R. 431). Outdoor activities of residents have been restricted (R. 295, 465). The chemicals causing odors were allegedly responsible for killing vegetation and destroying gardens (R. 251, 351, 431). One person found he had to leave town periodically (R. 458, 465, 466), and another remarked on the pronounced odors when he returned from outside the vicinity. One witness testified that his health improved on long periods away from the area (R. 350). Residents have complained to the Respondents. At times the complaints have resulted in immediate improvement, but in general it is of short duration (R. 76-7, 274).

Evelyn Monks has lived in Mapleton for 35 years. She identifies odors of fish and rotten eggs as being emissions of Respondents' plants. The odors are present only when the wind blows from the plants toward her. It is these odors that have burned her throat and made it difficult for her to breathe, caused her eyes to burn and awakened her during the night. She has observed foam on Pond Lilly Lake and foam and fog (which has a strong nauseating sulfur odor) rolling from Respondents' plants toward her residence. She associates the egg and fish smell mostly with Ashland Chemical Company but thinks both Respondents are responsible. She has made numerous calls to the Respondents to complain about the odors. She believes that the companies respond to the complaints and are able to eliminate the odors, if they want to. She bases this upon the fact that within 20 minutes of the time she calls, (often to suggest that the aerators in their lagoon be turned on) the odor disappears (R. 9-89).

Anna Mary Maddalozzo recalls certain air emission episodes involving the Ashland plant which have occurred ever since it began functioning. Emissions from the plant were apparently responsible for the discoloration of the paint on her home in 1964. She also states that the odors are present only when the wind is blowing from the plant toward her. She characterizes the odors as primarily burning odors such as burning tallow, and dead fish and sewage. She stays indoors because the odors give her headaches. She regrets

that her yard cannot be used for normal activities such as picnics and gatherings. She says, "I am thankful to the Good Lord that I have central air conditioning. Otherwise, I wouldn't be able to live in my home anymore." She is not bothered by emissions from the Caterpillar Plant but does differentiate the odors from Respondents' plants and those of Mapleton Industries which is an "anti-freeze" odor. She lives a quarter of a mile from the Ashland and Lonza plants and much closer to the Mapleton Industries facility. (R. 90-134).

Fred Monks is the husband of Evelyn Monks and has lived in Mapleton for 35 years. He has difficulty describing the different kinds of odors he has observed, but terms one of them "pond stink" and the other "odor from the cookers". He calls the first one pond stink because he associates it with the rotting condition of Pond Lilly Lake, which, he states, was beautiful and useable before the chemical companies came. Some of the manufacturing facilities in Ashland and Lonza he calls "cookers" and he also finds the odor from these highly objectionable. He believes both odors emanate from Respondents' plants and bases this on the fact that he experiences them only when the wind is from the southwest, south or east which would blow those odors toward his house. He also has made visual observations of the plants' operations and emissions from the bluff and believes this corroborates his other observations. He has kept daily records since May 17, 1971, noting types of odors and wind directions at his residence. He states, however, that this is not a totally accurate portrayal of the odor situation, since his observations are made during the day and many of the worst odors are experienced after nightfall. He has observed "the fog" roll along the ground from Respondents' plants to his residence. The fumes have an acid odor and reaction which burns his eyes. He says that when the wind is from the north, the air in Mapleton is as good as it was 20 years ago. The odors that he attributes to Respondents' facilities are different, in his mind, from those of Caterpillar which he characterizes as "iron smell" and odors from Mapleton Industries. He believes that the odors have affected his ability to walk and in the past several years his legs have become progressively weaker. However, when he left the area for a vacation, within less than a week his strength returned to the point where he could again engage in activities which he had given up, such as carrying suitcases upstairs and hunting in the hilly area (R. 203-381).

Virginia Sonnemaker has lived in the Mapleton area for over 50 years. She states that the odors from Respondents' plants sometimes "almost knock you down". She believes that the fishy odor may come from both plants. She finds the odor from Caterpillar to be distinctly different from any odors she associates with Respondents' plants. She associates the odors with Respondents' plants because

"every time you see this big steam coming up real fast (from the plants)...you are going to get the odor if the wind is just right... If the wind comes that way, we get it." She has seen the fog coming from the plants and believes that Lonza bears the primary responsibility for it. She had difficulty describing the odor of it, saying that "it's obnoxious" and feels that the odors are worse when the weather is muggy. She finds that the odors "run her into the house", and she is awakened at night by them. Even with the air conditioning on she notices them (R. 236-276).

Linda Bierwirth has lived in Mapleton for about 25 years. Her parents reside in town, although she herself has moved further away. She notices the odors when she passes by the plants and says,

> "It's just terrible. Especially when you have your heater running in the car in the wintertime. It seems to draw it in and it doesn't leave very swiftly. You can let your car sit for several days and it will still smell that way. Well, I would say -- of course, it's a joke with everyone in Mapleton that you can tell when you are getting home, that a blind man could find his way to Mapleton because right at the rise of the viaduct is where it really seems to hit you."

She says she has some respiratory difficulties that the odors aggravate:

> "I have a little problem, I have trouble with my sinuses and it seems that when the smell is real intense, it just, I feel like I want to explode, you know, but that hasn't really been too often because I try to stay in most, you know, most all summer because I have tried going out in the yard with the kids and I can't breathe." (R. 277-312).

Cleland Dailey says the smells sometimes wake him up in the night and are present about 50% of the time in the summer. He says the rotten egg smell is predominant and strongest at night. He identifies them with Respondents' plants because they come on a southeast wind and he lives northwest of the plants. He sees vapors coming from vents from both plants so he cannot specify which plant is responsible for which odor. When the odors get very bad "we take off and get out for awhile." He says in the past year they had gotten that bad about once a week (R. 439-467).

Edward Campbell is employed by the Environmental Protection Agency. In his investigations of Respondents' plants and in the vicinity of Mapleton he testified that he had inspected the Ashland wastewater treatment system. His observations were that there were putrifying odors in the area of the grease traps and flotation cells.

He also detected hydrogen sulfide odors at the pond, and the same odors at the viaduct on Route 24 which he attributed to the Ashland property. He stated that the odors were carried to that area from the Ashland property by a southerly wind. In his opinion, the real repugnent odor in the area seems to be because of the anaerobic condition in Ashland's "lagoon". He also testified that the Caterpillar facility used no chemicals in their process which would give a fishy or rotten egg odor. (R. 517-626).

Respondents have structured their arguments by denying that each singly has caused the odors. Both admit that there are odors in the Mapleton area which the citizens and residents consider obnoxious and for which the Respondents are in part responsible. As indicated above, the witnesses consistently identify Respondents Ashland and Lonza as being the source of obnoxious odor emissions in the Mapleton area. Evelyn Monks stated that she observed characteristically different odors from each of Respondents' plants -- odors that were identifiable and distinguishable from any other odors in the area. Anna Maria Maddalozzo similarly identified certain odors with the Ashland and Lonza facilities which were only present when the wind came off the plants in her direction. Dr. Richard Hoffman encountered the odors whenever he passed by the facilities and had traced them from his home to the Respondents' doorstep. Fred Monks identified two odors, "dirty pond" smell and "cooker" odor as being emitted from Respondents' plants. He had confirmed his observations by observing the visual emissions of the plants when the wind blew them in his direction. Virginia Sonnemaker pointed to Respondents as being responsible for odor problems in Mapleton. She had no difficulty in distinguishing their odors from other facilities, such as Caterpillar. John Monks also observed different odors emanating from Respondents' facilities.

The test for air pollution is found in Section 9(a) of the Act. It is whether any person has "caused or threatened or allowed the discharge or emission of any contaminant into the environment in any state so as to cause or tend to cause air pollution in Illinois, either alone or in combination with contaminants from other sources..." Section 3(d) of the Act includes in the definition of "contaminants", "any odor." Section 3(b) of the Act defines "air pollution" as "the presence in the atmosphere of one or more contaminants in sufficient quantities and of such characteristics and duration as to be injurious to human, plant or animal life, to health, or to property or to unreasonably interfere with the enjoyment of life or property." EPA v. Kaluzny Brothers #72-160, EPA v. Midwest Rubber Company #72-318 and EPA v.Lloyd A. Fry Roofing #71-33.

Odor emissions can cause air pollution. However, they are distinctly different from smoke violations or particulate emissions. Odor emissions are often not visible, and, like some other forms of pollution, such as noise, the reaction of citizens are highly individualistic and subjective. Also exposure to odors induces situation fatigue on the part of the observer so that his perception of odors, as well as his odor threshold, may change. In this case, the record is quite clear that residents were able to identify a number of different odors and to characterize them.We do not expect that all witnesses will describe the odors in exactly the same way. Nor do we expect that the witnesses should associate only one odor with the Respondents' operations. Indeed, there is substantial evidence that several distinct odors were the result of Respondents' operation. Of necessity, an odor emission is a subjective judgement, which is rarely constant or subject to measurement, seldom capable of precise definition or identification and differs from person to person in its impact.

Respondents have attempted to attribute the odors to other operations within the vicinity and particularly to each other. However, it is clear from the record that citizens can differentiate between odors caused by Respondents and those emanating from other sources. Other companies suggested by Respondents are Mapleton Industries and the Caterpillar plant. Witnesses testified that they indeed experienced odors which they associated with those plants and that those odors were distinct from those they associated with Respondents' operation. In the case of Caterpillar, the odor was "hot iron and metal" and in the case of Mapleton Industries, it was "anti-freeze odor" (R. 121-3, 400).

As previously mentioned, Respondents' plants are in close proximity. In some ways, it is difficult to imagine, given that fact and wind conditions that adequate differentiation of odors emanating from that vicinity would be possible. However, the record maintains very consistent associations of odors with various operations. "Rotten egg odors", and "swampy, lagoon-type odors" are attributed to Ashland's treatment plant (R. 61,205,385, 517). Chemical odors such as "ammonia" are associated to the Lonza processes (R. 246, 1142). "Fishy" odors are associated with both plants (R. 200, 1144). Further testimony included statements such as, "there was never a smell in those lakes until the chemical companies came to Mapleton..." (R. 208-9). And though we do not encourage testimony that is imprecise, we do not expect that citizens will be as articulate as chemical engineers.

Respondents have claimed that no evidence has been offered on the specific dates alleged by the Agency in the complaint. The record contains ample evidence on those dates, as indicated below. The Agency alleged violations beginning in July, 1970. Thirty-one specific dates were alleged, of which 30 were between May 17, 1971 and July 12, 1971. Proof was offered on thirty of those dates. Citizen observations of offensive odors which they associate with Respondents' plants cover a period between May 8, 1970 and November 2, 1972. (Complainants'

Exhibits 7, 8; Hearing Officer's Composite Exhibit #1 and Hearing Officer's Exhibits 1(a) through 1(ee)). Many exhibits are complaint forms filled out by employees of Ashland and Lonza after telephone complaints from residents. These complaint forms are revealing because they include the Respondents' observations of wind direction and plant inspection after the reception of the complaints.

For example: On July 8, 1970, a complaint was phoned in by Walter Robinson at 6:10 A.M. concerning an odor he characterized as "urine". Ashland noted that the wind was light from a westerly direction and that they could not detect any odors except for those in their #04 building where an employee noted the smell but could not find the source. Lonza observed the wind coming light from the southeast, but could not detect the odor at all.

On July 18, 1970, two complaints were made, one by John Southanner at 8:03 A.M. complaining of an onion odor and one by Mrs. Bruce Odenwalt at 8:37 A. M. complaining of a fish odor. Ashland noted that its inspection at 9:00 A.M. disclosed hydrogen sulfide coming off the pond. Lonza noted no odor at all.

On July 24, 1970, Mrs. Monks made two complaints or two separate times were noted by the Respondents. She apparently complained of a dead fish odor and Ashland observed that no fish odor was present, although they could detect a smell like coconut (which is apparently the odor of their #1295 or #1299 acids). Lonza found nothing unusual at their plant operations but a slight fishy smell coming from the "upper pond". Lonza also reported that "Cindy and Patti were in Mapleton and reported 'rotten eggs', but no amines odor. W. B. J. toured Mapleton and reported SO_2 odor, burning garbage odor and strong odor near Mapleton Industries. No amines odors."

On August 8, 1970, complaint by Mrs. Fred Monks at 8:00 A.M. was made concerning a blue fog. Ashland notes no wind, "Harold Lockwood observed a venting at Baird (Lonza) about this time. Haze was noted across the highway. Called Barry Monroe at 8:30. He verified it came from his plant..." Lonza noted south-southeast wind, light to moderate. "Amines pit operator was evacuating T-251 too rapidly. Operator was instructed to stop venting so rapidly. Fog then cleared (HCl vapors).

November 19, 1970, John Stouthanner complained at 9:45 A. M. about flock being discharged from the Plants. Ashland notes a brisk south wind and then states, "Not coming from Ashland. From warehouse roof I observed foam from Baird cooling tower blowing toward Mapleton, some as large as 2 to 3 feet in diameter...Air is heavy, holding vapors low."

On June 2, 1971, Patricia Lane complained of rotten egg odor at 4:05 P. M. Wind was moderate from the west. Ashland noted, "Cooling water from recovered to tank 2113. Semi-works were flushed out giving off H_2S gas." Lonza states, "At that particular time only

the evaporator was in operation...Personal reconnaissance of our areas shows no visible signs of air pollution, nor odors..."

On July 27, 1971, Phil Vansen complained at 3:30 A. M. about fumes from Baird. Ashland noted, "Baird was venting heavily. Phil Vansen called to complain that his roll operator was getting sick from the fumes and that guards could not make a check on diesel at reservoir. I called Baird and requested that they cut down venting a little. They did not like it but did cut down on fumes." Ashland noted a complaint at 8:20 P. M. from Roland Bassett and commented, "03 foreman reported that safety on tank (ammonia storage) had blown." Lonza noted the complaint at 8:50 P. M. and commented, "Phosphine batch in R-206 venting slowly through V-201. Garlic odor."

On October 21, 1971, John Willie was noted to have complained at 8:50 P. M. of a rancid grease or dead animal odor. Ashland commented, "Pumping B. F. talo [sic] from T/F (tank car) to tank 2004 at Northwest corner of 02 building. At approximately 20:45, the line was steaming out from T/F to tank 2004. I could discover no other unusual odor...Tank farm blowing line to 02 and tank farm after pumping tallow T/C started to blow approximately at time of complaint." Lonza notes, "Nothing unusual found on plant tour. Everything normal and under control."

On April 2, 1972, Mrs. Calhoun complained at 4:25 P. M. of foam from north cooling tower and a rotten egg odor. Ashland noted the wind was light from south, southwest direction and stated, "Problem. Dumped drum of Nalco into cooling tower basin to clean out algae. Noticed odor of gas like sulphuric gas. Large amount of foam blowing high into the air from the cooling tower. Especially when blower is running. Odor was coming from cooling tower."

In the approximately 2 years involved in this proceeding, there are hundreds of days where citizens have observed the presence of noxious odors. The record includes many additional complaints such as those noted above that are directly attributable to Respondents' operations. There is no doubt that Respondents have repeatedly violated the Act and have caused air pollution as therein defined.

Respondents have presented additional evidence consistent with the experiences of the Mapleton residents. Ashland Exhibits 64 through 69 support the testimony of Lee Jerome, Ashland's Plant Engineer, who testified that he experienced a choking odor associated with the visible discharges from Lonza's production facilities. Those exhibits show such discharges on September 14, 1971, October 12, 1971, May 4, 1972, August 30, 1972 and September 15, 1972. Mr. Jerome also stated there were days other than those that he recorded where the same kind of episode took place (R. 11-72). Ashland states in its brief,

"This choking sensation is similar to the burning of the eyes and throats claimed by the Monks and is consistent with the type of substance being discharged -- HCl. The action of the foam confirms that it has an acid content -- being heavier than air it would be carried along the ground. And, Lonza admitted at the hearing (Lonza Ex. 3B) to at least three episodes a year when it discharged 1,000 pounds of HCl gas in approximately 30 minutes.

"The record established the reason for the odorous emissions from Lonza. After experiencing the choking odors on one occasion, Lee Jerome called Husni Ramahi, Plant Engineer for Lonza, and complained. Ramahi responded that possibly they didn't have the water turned on in the scrubber or the scrubber was overloaded (R. 1169 to 1170). Barry Monroe, Plant Manager of Lonza, testified to other instances when part of the phosphorus trichloride system at Lonza suffered an upset resulting in a discharge of HCl gas (Lonza Ex. 1, page 4) and, as discussed above, that Lonza had at least three breakdowns a year where 1,000 pounds of HCl was emitted and at least one breakdown a year where 100 pounds of HCl was emitted and at least one breakdown a year where 100 pounds of dimethyl amine (DMA) is discharged (R. 1239 to 42). The complaint forms also establish other breakdowns at Lonza where a blue haze was emitted (Hearing Officer's Exhibit 1[i], 1[o], 1[p], 1[s], 1[x] and 20) because of venting process tanks to the atmosphere. (Ashland Brief, Pages 40 to 42).

Lonza also cites the testimony of Mr. Jerome but for a different purpose. In his description of Ashland's scrubbing process, Mr. Jerome stated that they could trace amounts of fish oils, tallow, coconut oil and the like in the waste water from Ashland's scrubbers (R. 1207). In addition, Ashland incinerates its residue from its fatty acids distillation in its boilers (R. 1208):

"Agency witness Girish Malhotra, in his written statement (EPA Ex. 12) testified as to the presence of 'sweet but nauseating' odors emanating from the Ashland lagoon area the day of an inspection trip he made on July 24, 1972. The witness stated that he smelled the odors off the premises of the plant after inspecting the same and the odor observed was the same odor that he noted coming from the Ashland lagoons, or present in the lagoon area, when they were there on inspection. He stated that they also smelled ammonia odors when they were south of the lagoon and he attributed those odors to the ammonia scrubber that had failed to operate (EPA Ex. 12, page 4). (Lonza Brief, pages 10 and 13).

Lonza says on page 2 of its brief "The overwhelming weight of the evidence in this case indicates that the basic underlying cause for the odor situation in Mapleton is...the waste water treatment facilities of the Respondent, Ashland Chemical Co." and supports its thesis with record citation. Ashland, in its reply brief, includes a section captioned "Lonza as a Potential Source of Odor" in which it makes a detailed and scholarly analysis of the record demonstrating that the fishy odors complained of could only be as a consequence of DMA and HCl "blue haze" emissions from Lonza. We agree, in part, with both Respondents Both have participated in the creation of an odor nuisance. The record supports the Agency's contention that both Respondents have emitted contaminants, in the form of odors which alone or in combination with other sources, have caused air pollution.

Many witnesses identified the odors as being associated with the wind from a southerly direction (R. 64, 109, 160-70, 317, 386). One of the witnesses had maintained a calendar which noted odors and wind direction and which corroborated the relationship. Respondents have attempted to impeach that testimony by offering evidence of wind direction as taken at the Peoria Airport. No evidence was presented to show a correlation between wind direction at the Peoria Airport and that in the Mapleton area. The record is clear that the plants lie in the Illinois River basin.The residents of Mapleton live in a location slightly higher than the plants in question, ascending the bluff. Evidence presented as to wind direction at Peoria Airport, since it has not been shown to be in the same river valley or in close proximity to the Mapleton area, is not acceptable as rebuttal to the evidence offered.

Respondent Ashland has admitted biocide emissions from the cooling tower which may have contributed to the odor problem (R. 1121-1122, Ashland Brief 44). The Agency witness identified the odors of rotting fat in Ashland's hot wells as well as observation of ammonia odors attributed to the breakdown of the ammonia scrubber (R. 831,832). Respondent Ashland argues that its "hot wells" and air flotation units had been corrected to eliminate odors prior to the filing of the complaint. The record indicates, however, that the covering of the hot wells did not begin until 1972 and the third air flotation unit was not on line at the time of the hearing (R. 1116).

The rotten egg odor has been attributed to the Ashland waste treatment lagoons (R.335-6, 593). Though some dispute exists as to the amount of correction needed, there is no dispute that certain problems have been present in the maintenance of the lagoon which have engendered the odor problem. Testimony by experts indicated that inadequate oxygen or inadequate mixing could result in an anaerbic condition which would produce the odors in question. (EPA Exhibits 9, 10,18, 19 and R. 923-977). The dispute appears to be only as to degree of treatment necessary and not whether such treatment is, in fact, required to effectively eliminate the odor nuisance.

In respect to Respondent Lonza, there is admission that hydrochloric acid (HCl) and dimethyl amine (DMA) emissions occurred on occasion. (Lonza Brief). These emissions would result in the "pungent" and "fishy" odors observed. Respondents only rebuttal is that they did not occur with sufficient frequency to be considered violative of Section 9(a).

The residents of Mapleton and those residing in neighboring areas have been subjected for an inordinate period of time to an extreme odor condition. Respondents are responsible for the significant portion of that problem and have violated Section 9(a) of the Act. During the past three years, the residents have noticed no improvement in that situation. Remedial steps taken within the last year are only indicative of the fact that the problem is a serious one; Respondents should have made improvements at an earlier time. There is no reason why a situation such as this one should be allowed to continue for any substantial period. Our Order, therefore, is structured to result in the abatement of the odor nuisance in as short a time as practicable.

Respondents should individually submit programs to the Board within sixty (60) days, which will abate the odor-producing operations noted above. With respect to Lonza, the program should include the necessary changes in equipment or operation to eliminate the odor nuisance caused in part by their admitted HCl and DMA discharges to the atmosphere. Lonza should act to eliminate any odor nuisance from their waste water treatment system, perhaps by maintaining aerobic conditions in their lagoons.

Ashland's program should achieve a similar goal, that is the elimination of the odor nuisance, both from the manufacturing, storage and handling operations and the waste water treatment system. Specific areas for control could include the hot well, cooling towers, amine production units, and aerobic lagoons system.

In summary, with respect to Respondent Lonza, we will require that they make an examination into their storage and handling systems to prevent discharge of odor substances such as HCl and DMA. Lonza's waste water treatment should also be examined for any anaerobic conditions. In regard to Respondent Ashland, the waste water treatment system should be the subject of a study to determine whether anaerobic conditions exist. This will be part of the program to be submitted within sixty (60) days, which will also include the study of potential odor sources from manufacturing, storage and handling facilities. A full report of the above investigation should be made to the Board and the Agency. Each program should be directed toward correction of problems which are the subject of this complaint. Each party shall be required to submit a bond in the amount of $20,000 to assure the submission of such program.

Pursuant to the program as submitted, Respondents, Ashland and Lonza, shall, within 150 days from the date hereof, abate the odor nuisance as set forth in this opinion.

The basic issue in the present case has been whether the Respondents have contributed to an odor nuisance as defined in the Statute. The totality of the record demonstrates without question that each Respondent has contributed significantly to the odor and resulting air pollution that has characterized the Mapleton area. Since the bulk of the offenses created can be ameliorated by utilization of known equipment and improved housekeeping practices, the record further demonstrates that it is both technologically practicable and economically reasonable to insist on employment of proper abatement methods and resulting compliance with the Statute.

Penalty in the amount of $10,000 is assessed against each Respondent, respectively, for causing air pollution, either alone or in combination with other sources, in violation of Section 9(a) of the Environmental Protection Act as found in this opinion. The odors emitted by each Respondent have been intense, consistent and obnoxious. They have contributed to the blight of an entire community.

This opinion constitutes the findings of fact and conclusions of law of the Board.

IT IS THE ORDER of the Pollution Control Board that:

1. Respondents, Lonza and Ashland, shall each submit to the Environmental Protection Agency, within 60 days from the date hereof, a program for abatement of their odor nuisances as found in this opinion and shall achieve abatement of such odor nuisances within 150 days from the date hereof.

2. Each Respondent, respectively, shall submit a bond in the amount of $20,000 in form satisfactory to the Environmental Protection Agency, guaranteeing the submission of the abatement programs as hereinabove provided, which bonds shall provide for forfeiture in the amount of $10,000, respectively, if said abatement is not achieved within the time provided. Bond shall be mailed to: Fiscal Services Division, Illinois Environmental Protection Agency, 2200 Churchill Drive, Springfield, Illinois 62706.

3. Penalty in the amount of $10,000 is assessed against each Respondent, Ashland and Lonza, respectively, for the causing of air pollution, either alone or in combination with other sources as found by this opinion, in violation of Section 9(a) of the Environmental Protection Act; within thirty-five days from the date of this Order, penalty payment by certified check or money order payable to the State of Illinois shall be made to: Fiscal Services Division, Illinois Environmental Protection Agency, 2200 Churchill Drive, Springfield, Illinois 62706.

4. The Board retains jurisdiction for such other and further order as may be appropriate. Such retention of jurisdiction shall not delay the right of any party to appeal this Order.

I, Christan Moffett, Clerk of the Illinois Pollution Control Board, certify that the above Opinion and Order was adopted on the 12th day of April, 1973, by a vote of 4 to 0.