

Air and Stream Pollution Control In Harris County, Texas

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DURING World War II the gulf coast area, especially around Houston, Tex., became industrialized. As many of the industrial plants started to operate before proper waste control equipment was installed, air pollution resulted. At the end of the war, materials were available again, and it was felt that industry should take steps to control their waste products.

Air pollution abatement was badly needed in the area. Since the larger industries had located mainly along the Houston ship channel, which stretches 70 miles from the inland metropolis to the gulf, the prevailing winds caused certain plants to affect a particular area more or less continuously. One physician from this area stated that whenever the wind blew from the east, he could expect to have an average of 20 patients with bronchial inflammation when ordinarily he had 3 or 4. While the concentration of the pollution was not as great in the entire area compared with other localities, the amounts found downwind from many of the plants were locally greater. Therefore, severe fumigations occurred in small areas and resulted

in damage to vegetation and human suffering.

It was at this stage that the subject of air pollution came dramatically to the attention of the Texas State Department of Health in the fall of 1951 on the receipt of a petition containing some 5,000 signatures from a group of citizens who lived in a small community, Greens Bayou, near Houston. Since this particular locality is developing into one of the largest industrial centers in the country, the State agency felt that it would be better to start air pollution abatement before it became a more serious problem.

Geographic Considerations

Meteorologically, the gulf coast area presents a different picture from that of the classic conditions of Los Angeles, Denver, and other areas. The terrain is essentially flat and the wind is predominantly prevailing according to seasonal variation. Temperature inversions occur about 180 days out of the year and extend from below Corpus Christi, Tex., to Lake Charles, La., and as far inland as San Antonio, Tex.

During these inversions, the stack effluent travels as a mass along the ground at about 3-5 miles per hour without much lateral mixing. Under these conditions, the usual stack height formulas are not applicable, and several industries in this area have found tall stacks undesirable as a means of reducing ground level

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concentrations. Also, since the plants are strung out along the ship channel from Houston to Galveston, it is easy to travel parallel roads and determine the exact width of the various plant stack plumes. With some experience, one can identify with certainty the source of a particular odor. Hence, the problem is immediately resolved into collection of the pollutants at the plant site rather than use of higher stacks.

Legal Provisions

Texas follows the common law as handed down from England except where specific provisions have been made by legislative action. Under this practice, it is a well-established doctrine that every person is entitled to a reasonable enjoyment of life and property, but he must so use his own property as not to cause injury to others. He is absolutely bound to conduct himself and to exercise what are regarded as his natural or personal rights so that he does not interfere unnecessarily or unreasonably in the exercise of rights common to all citizens. Every breach of this obligation has been held to be a nuisance. In addition, there are several laws in both the Penal Code and the Civic Statutes, as well as the Texas General Sanitation Law of 1945, which regulate and prescribe the method of abating nuisances. Also, the State health officer has the authority to quarantine or isolate any condition which affects the health of the public.

There are numerous cases in the records of the courts of Texas which extend the legal terminology covering nuisances and are rather specific in the decisions which are handed down. For instance, "When a business, lawful in itself, becomes obnoxious to neighboring dwellings, rendering their enjoyment uncomfortable by smoke, noise, offensive odors, or otherwise, it is a nuisance which equity will restrain" (1). This was a case decided against San Antonio, Tex., involving the proposed construction of garbage incinerators.

In another instance it was decided that "Where a cotton gin near a residence is a nuisance in that it interferes with the comfortable enjoyment of the residents, the owner, while not residing there, is entitled to injunction

against the nuisance" (2). Neither the fact that the trade is lawful, nor that it is needful, nor that the injury is unavoidable in the exercise of the trade, will excuse its operation in a locality where it inflicts actual injury on others, and that place for the operation of a trade is a convenient one, under the law, only when it is carried out where no injury results to others from it.

Coupled with these decisions is the one handed down by the Supreme Court of Texas in 1951, holding that "Where the tortious acts of two or more wrong-doers join to produce an indivisible injury, that is an injury which from its nature cannot be apportioned with reasonable certainty to the individual wrong-doers, all of the wrong-doers may be held jointly and severally liable for the entire damages and the injured party may proceed to judgment against any one separately or against all in one suit" (3).

By this last decision, it is not necessary for a complainant to prove the percentage of damage from any particular source. He may file suit against all suspected plants without dividing their responsibility. Therefore, under the statutes and court decisions in Texas, it has become relatively easy to obtain relief through the courts if desired.

Public and State Interest

As more and more of the citizens became interested, committees were organized and charged with the duty of obtaining pollution abatement through the various State agencies. The committees handled the work of collecting the signatures of complainants in a local area and transmitting the petitions to the Governor or State health officer with requests that these officers use their power under the State constitution to bring about corrections in the operating methods of the offending industries. These committees also conferred with the management personnel of the various plants and in some instances were able to obtain cooperation so that the plant took steps to reduce its individual pollution.

The State agencies, primarily the State health department, made exhaustive investigations to determine the sources of the air con-

taminants. The principle on which the abatement problem was attacked was that each plant should reduce its individual pollution to some extent even though, in comparison to another plant, this pollution was relatively minor. On this basis, all plants were expected to tighten their operation procedures, make use of collection devices, and to refrain from unnecessary release of contaminating materials.

In Harris County it was decided that instead of using a definite concentration of the noxious contaminants to be allowed in the stacks, the principle of allowing only that amount which did not materially affect the residents in close proximity to the plant was to be followed. In other words, it was not material whether or not a given plant expelled 10 or 100 tons of sulfur dioxide per day, but it was necessary to determine whether these amounts would give undue discomfort to the local residents.

Complaints from citizens had to be checked carefully by engineering personnel to determine their validity. However, as each plant started collecting its own pollutants, it was found in most instances to be easy to reduce pollutants to a point that abated the nuisance to neighbors.

The Program

In order to accomplish abatement of air pollution, the following program was evolved by the Texas State Health Department and the Harris County Health Department.

1. Open hearings were held by the State health officer. Both citizens and representatives of industry were invited to state their opinions on the conditions in the area. A record was made of the proceedings for study and distribution by the health department.

2. Meetings with industrial committees of the chamber of commerce were held and served to focus the attention of this civic group on the need for air pollution abatement; to inform industry through its top executives, who were members of these committees, of this situation; and to obtain help in forcing the few recalcitrant industries to cooperate with the health department personnel in solving their particular problems.

3. Representatives of industries known to be producing considerable pollution were invited

to conferences with the health department personnel to discuss their air pollution problems. At these conferences, the type of problem of the particular industry, the manner in which the management proposed to solve their problem, and their estimate of the time required to have the necessary equipment installed and in operation were determined. Included also was a discussion of the connection between their air pollution problems and any subsequent stream pollution which could result from improper handling of their liquid wastes. Finally, each industry was given the recommendations of the health department engineers. The recommendations were fully discussed along with reasons for such suggestions.

It was possible under the 1953 program, by cooperation with industry and interested citizen groups, to eliminate much of the industrial air pollution. Some plants had completely solved their problems; others were well on the road toward completing the installations which would remove the contaminants emitted to the atmosphere.

The relationship between industry and the health department personnel is quite cordial. In one particular plant where the health department insisted upon the installation of 2 bag-type dust collectors on automatic filling machines, it was found that each collector recovered 4 tons of material per day. This material is valued at \$100 per ton by the plant and retails for approximately twice that amount.

Another plant was using the air to dispose of fluorides which it had considered a waste product. This plant found that the material collected more than paid for the installation of the dust-collection system. There are many instances of financial benefit to plants from the installation and use of control equipment suggested by the health department engineers.

Plants which were given individual conferences by the health department engineers were reinspected after 3 months to determine the plants' true attitude toward cooperating in abating their air pollution and to determine what had actually been accomplished in the installation and construction of the necessary collection devices. It was found that about 50 percent of the plants were actively engaged in solving their particular problems, 41 percent

were still just talking, and only 9 percent actually did not intend to do anything.

Health Department Reorganization

Unfortunately for the air pollution work in Harris County, there was a change in personnel in the State health department and there was no one available to help carry on this work. Also, the county commissioners refused to allocate funds for air pollution control although they did organize a stream pollution control group instead of continuing the use of an outside consultant. The budget for this group was \$18,000 and included the employment of one engineer, one assistant engineer, and a biologist. Laboratory work was to be done at the regional State health department laboratory. Work accomplished by this group in the 9 months ending December 1, 1953, was as follows: 60 streams and bayous sampled; 96 sewer plants surveyed; and 4,350 laboratory analyses performed.

On December 1, 1953, \$10,000 was added to the remaining stream pollution budget and a combined stream and air pollution control section was formed. A separate laboratory, furnished with up-to-date equipment was organized and 2 engineers, 1 chemist, and 1 secretary were employed. The actual laboratory analyses for the first month were done at the State health department regional laboratory.

In order that no conflicts would be encountered between the authorities of the stream and air pollution group, the Houston industrial hygiene section, and the local office of the State health department industrial hygiene engineer, it was mutually agreed that the stream and air pollution group would concern itself with public nuisances and conditions caused by plant effluents after they left the plant property. In other words, the two industrial hygiene agencies were to work on inplant problems while the stream and air pollution control section considered things on an outplant basis. During the month of December the following work was accomplished: 2 streams and bayous were sampled; 2 sewer plants were surveyed; and 86 laboratory analyses performed. But for the most part, time was spent by the entire group in arranging the new laboratory and installing new equipment.

With the start of 1954, laboratory facilities were enlarged so that all the samples collected could be handled and the personnel could be combined into a better organization. The county commissioners' court voted a \$45,000 budget to cover the cost of operation of this section. Financial aid was given to the plan on a per capita basis by 17 municipalities in Harris County. Under the program for combating stream and air pollution in Harris County it was planned to include the following steps:

1. Stream sampling schedules were made to include collection of samples from every stream in Harris County each month.

2. The number of laboratory tests was expanded to include more specific analyses for industrial wastes.

3. Conferences were begun with industries to determine their progress toward eventual abatement of stream and air pollution.

4. A system for handling air pollution complaints was devised so that an immediate investigation could be made and a permanent record of the incident kept on file.

5. Abatement notices were to be issued when necessary to accomplish correction. For the most part these involved incidents in which it was possible to achieve the correction in a relatively short period of time.

6. Systematic recheck was to be made of the progress accomplished by the various plants in abating stream and air pollution.

During the first quarter of 1954 the following was accomplished: 43 streams and bayous sampled; 3,447 laboratory analyses performed; 108 complaints received and investigated; 24 industrial conferences held; 13 abatement notices issued; and 10 abatement notices complied with.

In comparing air pollution conditions existing at the end of the first quarter of 1954 with the same period in 1953, we found that of the 26 plants contacted during the first quarter of 1954, 31 percent have completely abated their pollution; 19 percent have installed equipment that will partially solve their pollution problems; 46 percent are organizing pollution control groups; and only 4 percent are still unwilling to cooperate. Thus, resistance to pollution abatement in Harris County has diminished considerably in the past year and progress is being made.

Planning for the Future

In planning for the future, we feel that we will always need a stream and air pollution control section to monitor the operations of existing plants and serve as consultants in the planning stage of new plants. The Harris County program will probably be continued, but personnel should be increased by at least 1 engineer and 2 chemists. This enlargement is becoming more necessary since the people within the county have found a group who try to obtain correction involving the industrial plants.

We have been flooded with complaints which require practically 24-hour duty on the part of some of our group. Also, it is becoming apparent that the use of the industrial conference, in which the plants' representatives meet with the stream and air pollution control section to discuss ways and means of abating their problem,

is the mainstay of the program. The handling of this portion of the work also requires practically the full time of one engineer and a secretary. This does not leave personnel available for actual plant inspections in the field. These inspections should be started and carried on as a routine measure to check on information supplied to our group by the plant's representatives. We believe that our group has progressed considerably in the short time of its existence and hope that we can continue at the same rate of progress.

REFERENCES

- (1) *City of San Antonio v. Hamilton*, Civ. App., 180 S. W. 160.
- (2) *Faulkenbury v. Wells*, 28 Civ. App., 621, 68 S. W. 327.
- (3) *Landers v. East Texas Salt Water Disposal Company, et al.*, 242 S. W. (2d) 236.

technical publications

Management and Union Health and Medical Programs

Public Health Service Publication No. 329. 1953. By Margaret C. Klem and Margaret F. McKiever. 276 pages; tables. \$1.

The third in a series of studies on health and medical services in industry, this volume describes the provision of medical care outside the plant for workers, and sometimes their families, under the sponsorship of employee organizations or management, or both.

The first two volumes in the series deal largely with facilities available to employees in plants. The first, *Industrial Health and Medical Programs*, is general. The second volume, *Small Plant Health and Medical Programs*, presents problems peculiar to small plants.

The first section of the present volume traces the development of employee health programs from the 19th century to the present. The development of workmen's compensation laws and the gradual extension of the laws to include coverage of occupational diseases are also discussed.

Section II defines the extent to which employed groups have medical protection through management- and union-financed programs and the types of benefits provided.

The third section describes methods of providing benefits and the characteristics of insurance company, Blue Cross, and Blue Shield contracts.

Section IV describes contract negotiations between management and labor for the provision of medical benefits and the various methods of financing and administering the benefits provided.

The fifth section describes in de-

tail several programs that have been developed to provide preventive and diagnostic services and in some instances treatment. Both the background and present status of these plans are outlined.

Appendixes contain detailed information that may be of assistance to persons interested in or responsible for the development and direction of employee health and medical programs.

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