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/pd control/

THE /FERTILIZER INDUSTRY/ IN /MEXICO/
AND THE POLLUTION PROBLEMS 1/

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INTRODUCTION

The chemical fertilizer industry in Mexico was begun around 1947 by producing phosphates.

This was started in San Luis Potosí, S. L. P. with the first single superphosphate plant. Three years later the fertilizer nitrogen industry was begun with the start of the first ammonia complex in Latin America near Cuautitlan, Mex. This complex consists of the ammonia and ammonium sulfate plants.

Growing demand of fertilizers has made it a necessity to install more fertilizer plants to meet this demand.

The following plants: are now functioning.

Product	Localization	Company	Process	Installed Capacity TM/year
Ammonia	Cosoleacaque, Ver. Camargo, Chih. Salamanca, Gto. Cuautitlán, Mex. Pajaritos, Ver. Minatitlán, Ver. Monclova, Coah.	PEMEX PEMEX PEMEX GUANOMEX F.F.M. GUANOMEX GUANOMEX		330,000 133,000 90,000 22,000 297,000 41,000 18,000
Phosphoric Acid	Coatzacoalcos, Ver. Minatitlán, Ver. Monclova, Coah. Cuautitlán, Mex. Salamanca, Gto. Guadalajara, Jal. Torreón, Coah.	GUANOMEX GUANOMEX GUANOMEX GUANOMEX UNIVEX GUANOMEX GUANOMEX		17,000 109,000 55,000 225,000 175,000 170,000
Nitric Acid	Coatzacoalcos, Ver. Salamanca, Gto.	GUANOMEX GUANOMEX	Societé Belge de L'Azote Chemico	100,000 100,000
Ammonium Sulphate	Guadalajara, Jal. Coatzacoalcos, Ver. Minatitlán, Ver. Monclova, Coah. Minatitlán, Ver. Camargo, Chih. Salamanca, Gto. Cuautitlán, Mex. Guadalajara, Jal.	I.Q.M.S.A. GUANOMEX GUANOMEX GUANOMEX GUANOMEX GUANOMEX GUANOMEX GUANOMEX GUANOMEX	Struther Wells Chemico Chemico Chemico	60,000 40,000 80,000 110,000 68,000 305,000 85,000 56,000
Ammonium Phosphate	San Luis Potosí, S.L.P.	GUANOMEX	Saint Gobain	120,000
Ammonium Nitrate	Pajaritos, Ver. Minatitlán, Ver. Monclova, Coah.	F.F.M. GUANOMEX GUANOMEX		55,000 241,000 140,000
Urea			Dorr Oliver Canada Research Saint Gobain Snam Progetti Toyo Kotsu Lonza-Lummus	50,000
Normal superphosphate				
Triple superphosphate Complex NPK				
			PEC A. J. Sackett	

The production of the fertilizer industry has been toward geared mainly obtaining solid fertilizers, but there are also two fertilizer plants which are producing fluid fertilizers and two more which are producing foliar fertilizers.

All the fertilizer plants pollute the water and the air in different degrees according to the process employed in each plant.

I GOVERNMENT POLITICS

The Government of Mexico has concerned itself with the preservation of the Nation's ecology. For this reason in December of 1970, the Environmental Protection Undersecretaryship was created by presidential decree and became a dependency of the Public Health Department. This dependency worked in the development of a law, which was presented and approved by The Congress of the United States of Mexico and published in the official newspaper on March 23, 1971, under the title of "Federal Law To Prevent and Control Environmental Pollution". This law specifies the pollutant sources and pollutants which will be subjected to prevention, regulation, control and prohibition by the Federal Government, no matter what their source or origin is, so long as they are able to produce contamination or degradation of the ecology systems, both in a direct or an indirect manner.

Based on this law, work has been done on the following regulations:

- 1.- Prevention and Control Regulations for Atmospheric Pollution created by Fumes and dust.

This regulation was approved by the Federal Government on September 8, 1971. In it, it specifies it's scope, defines dust and fumes emissions and points out the limits permitted and the methods

used to calculate them. It also indicates the sanctions which will be applied to the violators of this law and the administrative resources available to the violators.

2.- Prevention and Control Regulations for Water Pollution.

This regulation was approved by the Federal Government on March 28, 1973. It establishes the limits which waste water effluents will be permitted to have according to their volume and the place of discharge. It also establishes the datelines to register discharges, present engineering preliminary information, and the time in which to install the necessary equipment to eliminate the pollutants.

3.- Regulation under process of elaboration soon to be approved :

- A.- Prevention and Control Regulations for Atmospheric Pollution created by gas emissions.
- B.- Prevention and Control Regulation for Noise Pollution.
- C.- Prevention and Control Regulation for Pesticide Pollution.

II FUME AND DUST EMISSIONS

Fume emissions were determined on all stacks of stationary fuel burning equipment which burn natural gas, diesel or fuel oil. These same determinations were made on all movil equipment scapes.

The determinations were made by using the Ringelmann Smoke Chart and in the case of stationary sources particle emissions were also determined.

As a solution to the emission problems found in stationary equipments, mayor control is being enforced in the relation of air/fuel of the burners. The equipments which utilize fuel oil are being provided with more efficient atomizers for their combustion systems.

The fume emission problems of movil equipments have been resolved by keeping a close ckeck on the state of the air filters and the state of the motor carburations, providing general maintenance to the machines which require it.

Dust emissions were determined for solid particles as well as mists, at every emission source of the ammonium sulphate, ammonium nitrate, urca, ammonium phosphate, complex fertilizers, superphosphates and wet-process phosphoric acid plants.

The above determinations were realized in accordance with the procedures

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developed by GUANOS Y FERTILIZANTES DE MEXICO, S. A. , some of which are based on the official procedures of the EPA (Environmental Protection Agency), others were adapted to the special circumstances which were required in each case, mainly those related to mists.

During the dust emission determinations, ammonia and fluorine emissions were evaluated, because these emissions are expelled along with the dust emissions already mentioned.

The results of the preceding emission determinations made it necessary to take the following steps:

- 1.- To carry on mayor control of the operation parameters, directly linked with the dust production. Through this control greater efficiencies were obtained and some plants were made to operate within the specified limits of the law.
- 2.- To install scrubbers to recover ammonia.
- 3.- To install dry and wet collectors to decrease dust emissions. The selection of either collector type, was determined mainly by the dust concentrations in the gas streams, the physical and chemical properties of the dust, the dust value and the equipment costs.

4. - To install mist eliminators of the mesh and cyclonic types.

Up to now, some of the equipments have already been installed, others are in the process of being installed and the rest are being designed.

III INDUSTRIAL WASTE WATER

At the present time, contamination problems by waste water are under study.

Up to date, effluent plant evaluations of superphosphates, wet-process phosphoric acid, sulphuric acid, ammonium sulphate and ammonium phosphate are being made.

In the case of industrial complexes the policy has been to form only one contaminated effluent; the treatment of this effluent is mainly directed towards recovering chemical compounds when ever it is technically and economically possible.

Plant effluents of nitric acid, ammonium nitrate, complex fertilizers and wet-process phosphoric acid, are now under study in an industrial complex. At the present time, the control of operation variables is being studied in order to decrease contamination levels. Afterwards a determination will be made to establish which effluents should be united for common treatment.

It is believed that all the personal in charge of fertilizer plants in Mexico has been made to become conscious of the pollution problems and everyone of them working within these plants takes an active part in the prevention and decreasing of pollution.

IV GAS EMISSIONS

The emissions of ammonia and fluorine have been evaluated due to the circumstances before stated.

In view of the program to control and decrease environment contamination, the following priorities were established:

First. - To decrease the smoke and dust emissions.

Second. - To decrease the waste water contamination.

Third. - To decrease the gas emissions.

Work is now being done to elaborate the regulations for the control and prevention of gas pollution.

V PROBLEMATICS

To carry through a program which will prevent and control the air pollution, it has been necessary to consume efforts and resources that transformed into money represent a heavy burden to the nation.

There was a lack of experience to evaluate the water pollutants as well as the air pollutants and it was necessary to adopt the measurement methods and to prepare the personal needed to carry them out.

The above mentioned represented excessive expenses but it was more economical than to make a contact with foreign companies mainly because all the experience remained in this country.

México is a very large country and its territory has several mountain chains, wich make it difficult to travel through.

It becomes a problem to make the determinations of pollutants in water and air above all. Because the fertilizers manufacturing plants are small and distributed all over the country.

Up to date, the main problem is the gypsum which is obtained as a by-product in the wet-process phosphoric acid plants, because it contains many fluorine compounds that contaminate the soil they are deposited on.

There are several processes to manufacture sulphuric acid or fertilizers from gypsum, but it is necessary to subject the gypsum to a washing process which increases the cost, and the investments to the plants which use it are very high.

All this makes it impossible to justify the installment of these plants in Mexico, above all because Mexico produces and exports sulphur. All the manufacturing plants that consume sulphur in Mexico have low investments and its manufacturing costs are relatively low.





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