

(Air)

**NO** : 509  
**TITLE** : Characterization and Control of Air-Borne Particles in Industrial and Mining Operations in Relation to Meteorological Conditions .  
**AUTHORS** : M. A-K. Mohamad.  
**ADDRESS** : Dept. of Metallurgical, Faculty of Engineering, Assiut University.  
**BULLETIN** : Thesis, 1982.

**ABSTRACT**

The objective of this research is to develop an improved understanding of the characteristics of air-borne particles, which are very important for controlling air quality in a work environment. Experimental design was conducted to collect the samples of air-borne particles and prepare these samples in order to be analyzed by the scanning electron microscopy techniques. Air-borne particles were characterized in terms of particle volume equivalent diameters, lengths and widths as well as elemental composition. Mathematical models were derived and used for predicting the dust concentrations. Acceptable dust concentration was determined based on quartz content in the dust particles.

Relationships of dust concentration; with air velocity, distance from the dust source, and sampling height in open atmosphere and in enclosed areas during mining and industrial operations are derived. Dust control methods for these working environmental conditions were suggested.

**NO** : 510  
**TITLE** : Simple Formulae to Determine Pollutant Concentration From Stacks for Short Term Model .  
**AUTHORS** : M. A-K. Mohamed and A. M. Majied\* .  
**ADDRESS** : Dept. of Mining & Metallurgical Engineering, Faculty of Engineering, Assiut University and \*Physics, Faculty of Science (Qena), Assiut University.  
**BULLETIN** : Bull. Fac. Sci, Assiut Univ., Vol. 21(1-A), 1992.

**ABSTRACT**

Gussian model is investigated as the basic formula of pollutant dispersion. Pollutant concentration is calculated at different values of emission rate, effective stack height, wind speed, lateral distance from the downwind direction and distance downwind from the source. Simple forms of the relationship between the pollutant concentration and the above variables are derived. So that the pollutant concentration can be estimated knowing the effective stack height, wind speed, lateral distance from the downwind and distance from the stack along with the emission rate.

(Air)

**NO** : 511  
**TITLE** : Behavior of Pollutants from the Instantaneous Sources in Mine Airways.  
**AUTHORS** : M. A-K. Mohamed.  
**ADDRESS** : Mining and Metall. Engineering Dept., Faculty of Engineering, Assiut Univ.  
**BULLETIN** : 6<sup>th</sup> International Energy Conference, Vol. III , Alex., 19-22 April 1993.

**ABSTRACT**

Classical diffusion equation is taken as an analytical air quality model to investigate the behavior of the instantaneous concentration of gas pollutants. The amount of the emitted gases per unit area from the blasting operation in mine airways can be determined, if concentration of any gas is measured at a known time after blasting and distance from the source. A simple computer program has been developed. This program will output the concentration of the pollutants.

**NO** : 512  
**TITLE** : Cyclones as a Precollectors for Air Pollution Control.  
**AUTHORS** : M. A-K. Mohamed and A. M.Rizk.  
**ADDRESS** : Dept. of Mining and Metall. Engineering, Faculty of Engineering Assiut Univ.  
**BULLETIN** : Bull. Fac. Eng., Assiut Univ., Vol. 21, No. 2 July 1993.

**ABSTRACT**

Cyclones are used to remove particulate matter from air streams in numerous industries as a precollectors before using the bag fillers and/or electrostatic precipitators. Consequently, the main objective of this investigation is to study the effect of cut diameter ( $d_{cut}$ ) as well as the number of cyclones in a battery on their diameter as a main design parameter, and the produced pressure drop as a main operating parameter at the inlet velocity in the range of 9 to 30 m/sec. From the preliminary calculations, it is found that the cut diameter of the particulates in the case of using a single cyclone is coarser than that when using a battery of multiple cyclones. It is noticed that the overall collection efficiency increases as the number of cyclones in the battery increases at a constant flow rate, and as the cut diameter decreases. It is also found that the overall efficiency decreases as the degree of fineness of the particles increases.

(Air)

**NO** : 513  
**TITLE** : Studies on Particulate Matter Dispersion and Deposition Around the Aluminium Plant. (Nag Hammadi, Egypt).  
**AUTHORS** : M. A-K. Mohamed, S. M. Al-Shazly\* and A. M. Majid\*.  
**ADDRESS** : Dept. of Mining and Metall. Eng., Faculty of Engineering., Assiut University and \*Physics, Faculty of Science., Assiut University (Qena) .  
**BULLETIN** : Bull. Faculty Eng., Assiut Univ., Vol. 22, No. 1 January, 1994.

**ABSTRACT**

Models of deposition and dispersion are interpreted and applied on the particulate matter from aluminum plant. Emission rate of particulate matter was calculated to be 3090.1 g/sec. Maximum concentration along the centerline was found to be 82545.43 mg/m<sup>3</sup> at a wind speed of 2.67 m/sec and a distance of about 300 m from the stack. Maximum deposition rate of particulate matter was found to be 978.34 g/m<sup>2</sup> 30 days at a distance of about 300 m from the stack. Furthermore, particulate concentration and deposition rate are intended to be studied.

**NO** : 514  
**TITLE** : Particulate Emissions from Some Sources in Surface Mining.  
**AUTHORS** : M. A. K. Mohamed.  
**ADDRESS** : Dept. of Mining and Metall. Eng., Faculty of Engineering, Assiut University.  
**BULLETIN** : Proceedings of the Fourth International Symposium on Mine Planning and Equipment Selection/Calgary/Canada/31 October-3 November 1995.

**ABSTRACT**

Particulate emission rates from drilling, loading and crushing at limestone quarry, Assiut cement company in Egypt are calculated using the dispersion model. Values of emission rates from drilling, loading and crushing are 2513.73, 2151.43, 967.37 mg/sec respectively. Particulate concentration from mining operations can be predicted at any point of known coordinates and wind speed. Therefore, distribution of the particulate from these ground sources can be studied to get rid of the exposure to these pollutants in the vicinity of surface mining areas.

(Water)

<b>NO</b>	: 515
<b>TITLE</b>	: The Use of Hydrocyclone as a Mean for Turbid Water Treatment .
<b>AUTHORS</b>	: A. A. Mohammed .
<b>ADDRESS</b>	: Dept. of Civil, Faculty of Engineering, Assiut University.
<b>BULLETIN</b>	: Thesis, (M.Sc.), 1984.

**ABSTRACT**

In this work, a trial to find a new field for using the hydrocyclone as a mean for separation of solid particles (such as : sand, silt, clay, ...etc.) from turbid water. The hydrocyclone used in our experimental studies is made from brass, of 100 mm. Diameter, 500 mm. total length and 20° cone angle. The main variables (constructional and operating) of the hydrocyclone are changed in a relatively wide range. The effects of main constructional variables (inlet diameter overflow diameter and underflow diameter) upon the capacity of hydrocyclone, the concentration of suspended solids in water in both overflow and underflow streams, and efficiency of hydrocyclone are studied. Studies are made also to find the effects of the inlet concentration of suspended solids in water which is one of the main operating variables. Representation and analysis of experimental data are included and many mathematical formulae connecting the main parameters with both the capacity of hydrocyclone and its efficiency are also deduced .

(Water)

<b>NO</b>	: 516
<b>TITLE</b>	: An Investigation of Influence of some Physical Parameters on Porous Media Filtration .
<b>AUTHORS</b>	: A. A. Gad.
<b>ADDRESS</b>	: Dept. of Civil, Faculty of Engineering, Assiut University.
<b>BULLETIN</b>	: Thesis, 1987.

### **ABSTRACT**

Water has to pass through different processes for the purpose of disaffection and removal of impurities. Sedimentation removes high percentage of suspended impurities and low percentage of bacteria. For removal of bacteria, colour, taste, odour, iron, manganese and producing of clear and sparkling water, filters are used. It is well known that the filtration process can be carried out through either downflow or upflow of water through filters .

In this study the filtration materials used in an upflow filter were gravel and sand. The sand bed thickness was changed from 40 cm to 140 cm, while the gravel layer thickness was kept constant at 30 cm. The influent raw water turbidity was varied from 10 to 40 N.T.U. Also, the efficiency of algae removal for different depths of sand filter was examined .

From analysis of the experimental results it was found that the used system produced filtrate with acceptable quality (<5 N.T.U.) with a filter run more than 72 hours when the sand depth is equal to or more than 120 cm, the influent turbidity does not exceed 40 N.T.U., and under a pressure drop of 80 cm . Both the head loss through the filter and the water quality increase with the increase of sand depth in the filter. The sand depth greater than 120 cm has a negligible effect on the effluent quality. Also it was found that this system is able to adjust itself to the adverse conditions such as loss of power or shutoff the pump .

A mathematical formulae connecting the main parameters with the removal efficiency of the suspended solids and algae are also deduced .

(Water)

<b>NO</b>	: 517
<b>TITLE</b>	: Water Treatment by Using Downflow and Upflow Filters in Series .
<b>AUTHORS</b>	: Y. A. Hassneen .
<b>ADDRESS</b>	: Dept. of Civil, Faculty of Engineering, Assiut University.
<b>BULLETIN</b>	: Thesis, (M.Sc), 1988.

### ABSTRACT

Water that is absolutely pure is not found in nature. Water vapor in the air condenses as particles and, as it falls, absorbs dust and dissolved oxygen, carbon dioxide, and other gases. At the ground surface it takes up silt and other inorganic matter. Before using the water, it must be treated to reach the required standards of purification .

Sedimentation, with or without coagulation, will not ordinarily give adequate treatment to water. The production of clear and sparkling water, with the utmost safety requires the use of a filter.

Because filtration is an important process in each water and wastewater treatment, the process of removal of suspended solids is carried out in filters . Many studies were carried out to explain the theory of filtration, the systems of the filtration, the efficiency of the filters and the backwashing process .

The purpose of this research is to study the parameters influencing the filtration processes by using two filters, connected in series to allow the water to flow downward in the first filter and upward in the second one. The model used in our experimental work consists of two circular columns of perspex glass of 15 cm diameter, 240 cm and 150 cm length for first and second filter respectively .

(Water)

<b>NO</b>	: 518
<b>TITLE</b>	: Direct Filtration of Water Through a Series of Filters Using Graded and Reverse Graded Coarse-Media for Contact Flocculation .
<b>AUTHORS</b>	: A. A. Ali.
<b>ADDRESS</b>	: Dept. of Civil, Faculty of Engineering, Assiut University.
<b>BULLETIN</b>	: Thesis, 1991.

### **ABSTRACT**

Contact flocculation is a relatively new, simple, and relatively inexpensive process used in water treatment. In this study, a new direct filtration system contained two contact flocculation units connected in parallel was examined. The contact flocculation units contained graded and reverse-graded coarse media ahead of standard dual-media filters . The pilot treatment plant used in this study contained two raw-water storage tanks, a cpump and a constant head tank, a rapid-mix tank, two contact flocculation columns with coarse media, two dual-media filters contained anthracite coal and sand, flow control tanks, alum and polymer solution feeding pumps and tanks, measuring and data collection devices (turbidimeters, pressure transducer, flow-meters, data acquisition connections, digital computer pH- flow-meter, ... etc.) .

The purpose of this study was to evaluate the use of control flocculation units containing coarse media in direct filtration treatment of turbid water.

The main results of this investigation proved that gradient media contact flocculation units can be used successfully remove turbidity and suspend solids from water. The unit which contain smaller size graded media on the top and larger size the bottom produced a better water quality than that produced for the reverse-graded unit containing media of the same sizes depths. The use of a metal coagulant such as alum or ferrous chloride with organic polymer is a very important factor needed to improve the effluent water quality.

An overview on drinking water works in Assiut city, Egypt is presented. This overview includes discussion on surface water treatment plants, ground water plants, distribution networks, water consumption and water quality in the city, and a foreign example of water plants.

