

PRELIMINARY CONTROL TECHNOLOGY ASSESSMENT

OF

Ozark Lead Company
Sweetwater, Missouri

SURVEY CONDUCTED BY:
Frank W. Godbey

REPORT WRITTEN BY:
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SURVEY DATE:
August 17, 1981

REPORT NO.:
ECTB 111-14a

NATIONAL INSTITUTE FOR OCCUPATIONAL SAFETY AND HEALTH
Division of Physical Sciences and Engineering
Engineering Control Technology Branch
4676 Columbia Parkway
Cincinnati, Ohio 45226

PLACE VISITED: Ozark Lead Company, Sweetwater, Missouri

DATE OF VISIT: August 17, 1981

PERSONS CONDUCTING SURVEY: Frank W. Godbey

COMPANY REPRESENTATIVES
CONTACTED:

Jack Cottrell, Safety and Environmental
Control Director
Mike Young, Operations Superintendent
Terry Mais, Concentrator Superintendent
William Shanks, Maintenance Superintendent

PURPOSE OF SURVEY:

To investigate Ozark's methods of controlling potential health hazards in the beneficiation of lead ore and to determine the advisability of conducting an indepth survey of this plant.

INTRODUCTION

The Engineering Control Technology Branch of the Division of Physical Sciences and Engineering, NIOSH, is conducting a research study to assess and document control methods for minimizing worker exposure to harmful substances, operations, and processes in the beneficiation of galena² and cerussite (lead) ore industry. Exposure to a number of substances used in the beneficiation of lead ore may lead to a variety of health problems. These substances include lead, silica, nuisance dusts, and flotation reagents.

This preliminary survey was conducted to obtain information on control technology used in the industry including engineering controls, monitoring devices, work practices and protective equipment, and to determine the advisability of conducting an indepth survey of this plant.

PLANT DESCRIPTION

Full lead ore beneficiation production began at the Ozark Milliken operation in 1971. Approximately 6,000 tons of crude ore, averaging between four and five percent lead, is processed per day. The mill operates five days per week, 24 hours per day, to produce lead and zinc concentrates. The company employs approximately 440 persons at their Milliken operation with 18 in the mill.

PROCESS DESCRIPTION

The above-ground concentrator process begins at the cascade type crushing facility consisting of seven foot diameter secondary and tertiary hydrocone crushers, which reduce the ore to minus 5/8 inch (Figure 1). A continuous belt conveyor monitored by closed circuit television, carries the ore to the concentrator fine ore storage silos. From the storage silos, ore is proportionally mixed with water and fed into the grinding circuit, successively ground by a 13 1/2 x 16 foot rod mill and a 15 x 19 foot ball mill in closed circuit with hydrocyclone classifiers. The flotation feed pulp is conditioned by automatically controlled reagent additions and processed through the lead recovery flotation circuit. The resultant tailings are then reground to free the more finely disseminated zinc sulfide, which is fed through the zinc flotation circuit. The concentrate from each circuit flows out to the thickener tanks where the pulp is thickened to 70% solids and pumped to the respective drum type belt filters. The filtered dewatered concentrate is then stored in loading bins until it can be automatically loaded out in measured lots for haulage by contract truck to the smelter.

HEALTH AND SAFETY PROGRAM

The health and safety program is conducted by the Safety and Environmental Control Director who conducts periodic inspections of the facilities including quarterly environmental sampling. A good house-keeping program consists of washing down spills and residual dust as necessary to maintain work area floors in reasonably clean condition. A formal MSHA-required health and safety training program is conducted by Company personnel.

CONTROLS

There are no specific engineering controls employed in this operation, such as ventilation systems and flotation cell covers, other than a central control room facility equipped with closed circuit television for monitoring a continuous belt conveyor system.

CONCLUSIONS/RECOMMENDATIONS

The Ozark Lead Company, Milliken Concentrator, is not recommended for an indepth study since it does not have any sufficiently unique state-of-the-art controls not found in other concentrators previously recommended for study.