

NOTE: TRADE SECRET DATA HAVE BEEN REMOVED FROM THIS REPORT.

NATIONAL OCCUPATIONAL HEALTH SURVEY OF MINING

BARITE REPORT

SEPTEMBER 24, 1990

COMMENTS SHOULD BE DIRECTED TO:

PROJECT OFFICER
NATIONAL OCCUPATIONAL HEALTH SURVEY OF MINING
NIOSH
DIVISION OF RESPIRATORY DISEASE STUDIES
944 CHESTNUT RIDGE ROAD, ROOM 140
MORGANTOWN, WEST VIRGINIA 26505-2888

PHONE: FTS 923-4496
304-291-4496

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INTRODUCTION

This is one of a series of reports on the National Occupational Health Survey of Mining (NOHSM), which has been carried out by the National Institute for Occupational Safety and Health (NIOSH). The NOHSM began in May, 1984, as an effort by NIOSH to obtain representative data related to occupational health from the mining industry. This particular report provides NOHSM data for the Barite commodity. Five (5) sample sites were selected from the Barite population of active mining facilities. All five of these sites were surveyed between June, 1988 and May, 1989. The data collected were similar to the information previously obtained in non-mining studies. Specifically, NOHSM data include:

- a. Occupational health program and policy information;
- b. An inventory of all health-related substances found on mine property; and
- c. A series of worksite observations which detail potential exposure to chemical and physical agents.

These data were collected by surveyors who traveled to each mine site. The survey sites were chosen so as to provide a statistically valid representation of each commodity at the time of the NOHSM sample selection. With this representative sample, NIOSH can project survey data to the entire mining industry.

The NOHSM is being carried out primarily as a service to the Mine Safety and Health Administration (MSHA), and secondarily as a source of information for NIOSH investigators and other interested parties. MSHA plans to use the data for three purposes:

1. To set regulatory priorities and write improved health standards;
2. To improve compliance with existing standards; and
3. To identify and determine research needs and priorities.

This transfer of information to MSHA is mandated by Section 201 of the 1977 Federal Mine Safety and Health Amendments Act.

This report identifies potential exposures and provides the associated numbers of workers, the occupations of those workers, and the locations on the mine property where the potential exposures were observed. This information is categorized into seven tables: four concerning chemical agents; one concerning musculoskeletal overload conditions; one concerning physical exposure conditions; and one concerning welding processes. Estimated annual usage information is provided for chemical substances, both generic and trade names.

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This report lists the survey findings in a number of individual tables representing the different products and conditions to which workers in the commodity were found to be potentially exposed. The following is a breakdown of these tables, including the number of agents associated with each table, for the Barite commodity:

Table 1	--	6	MSHA-regulated chemicals.
Table 2	--	1	Chemical that has a NIOSH recommended exposure limit but is not MSHA-regulated.
Table 3	--	6	Chemicals that have no NIOSH recommended exposure limit and are not MSHA-regulated.
Table 4	--	87	Trade name products.
Table 5	--	4	Physical agent conditions.
Table 6	--	12	Musculoskeletal overload conditions.
Table 7	--	3	Welding processes.

It is extremely important that the limitations of the reported data be recognized. The data do not in any way document exposures or exposure levels. The data only indicate potential exposures. The term "potential exposure" means the agent was observed to be present at one or more worksites in such a way that there was a possibility of workers being exposed to the agent.

Likewise, the usage data presented in some of the tables are only a guide to the projected magnitude of usage and should not be taken as precise information. The usage data are based on estimates provided by mine management. It is expected that these estimates have widely varying accuracy. Occasionally, an item may be represented as having an annual usage of zero with workers observed to be potentially exposed. This may occur because annual usage estimates are generally based on purchases of the 12 months immediately preceding a survey. Therefore, items purchased prior to that 12 month period may be represented as having a zero annual usage rate even though potential exposures were observed during the survey. Other zero annual usage occurrences could involve recyclable items such as some catalysts and desiccants, items such as paints and coatings which are applied prior to the 12 month period but which are present in the workplace in such a way as to present a potential exposure, and obsolete items which are no longer actively used on the property but to which employees could still be potentially exposed in the course of their work. Furthermore, all the estimates were rounded to the nearest whole number, with all quantities between 0 and 1 being reported as 1. Thus, extremely small usage levels may actually be lower than estimated. With this possible exception, NIOSH believes the relative magnitude to be appropriately represented.

Another limitation to be observed is the terminology associated with the commodity, occupation, and location. These terms were adapted directly from MSHA information and applied by NIOSH. NIOSH recognizes that other parties may prefer other commodity, occupation, or location terminology. The MSHA terms were used because of MSHA's close interest in the data.

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A separate report will be prepared for each commodity surveyed as a part of the NOHSM. During each segment of the NOHSM, approximately 120 mining operations were surveyed as the sample from a number of selected commodities. A different set of commodities was surveyed during each segment. NIOSH plans for use of these data in the future include:

- a. Encourage MSHA use of the data, as outlined above;
- b. Determine the ranges of exposure to various agents, as required by Section 201 of the 1977 Federal Mine Safety and Health Amendments Act;
- c. Assist in setting priorities for mine-related occupational health research; and
- d. Respond to questions from other parties regarding occupational health aspects of the mining industry.

Information beyond that presented in this report has been collected during the NOHSM. All of the information not protected by trade secret claims is available to the public upon detailed written request. Other categories of available information include:

- a. Management policies related to occupational health;
- b. Duration of potential exposures;
- c. Operations associated with potential exposures;
- d. Controls employed with potential exposures; and
- e. Results of bulk dust analyses for silica, metals, and fibers.

Interested parties should direct their requests to:

Project Officer
National Occupational Health Survey of Mining
NIOSH
Division of Respiratory Disease Studies
944 Chestnut Ridge Road, Room 140
Morgantown, WV 26505-2888

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TABLE DEFINITIONS

<u>AGENT NAME</u>	(1) # WORKERS POTENTIALLY EXPOSED (OBSERVED)	(2) # WORKERS POTENTIALLY EXPOSED (PREDICTED)	(3) % WORKERS POTENTIALLY EXPOSED (PREDICTED)	(4) PREDICTED ANNUAL USAGE	(5) OCCUPATIONS	(6) LOCATIONS
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Column (1) represents the total number of workers in occupations within this commodity in which a potential exposure to an agent was observed or identified through questioning of mine management or workers. This number only includes workers from the NOHSM sample sites. A "potential exposure" means the agent was observed to be present at the worksite in such a way that there was a possibility of workers being exposed to the agent. The potential exposures do not imply any exposure level, nor do they imply the absence or presence of controls.

Column (2) represents the number of workers within this commodity predicted to be potentially exposed to each agent. This number reflects a projection to this entire commodity, based on data obtained at NOHSM sample sites.

Column (3) represents the percentage of workers within this commodity predicted to be potentially exposed to each agent. Column (3) is obtained by dividing column (2) by the projected total population of workers in the commodity.

Column (4) represents the number of gallons (GAL) or the number of pounds (LBS) of each chemical that NIOSH has estimated to be used per year. This number is obtained from projections based on estimates of usage provided by mine management, and should only be used in determining the order of magnitude of usage. It should not be used as a precise figure. This number reflects a projection to this entire commodity, based on data obtained at NOHSM sample sites. In some cases, where usage data was unavailable, a "x" appears in this column.

Column (5) contains the occupations observed to have a potential for exposure to this agent. In each occupation, the percentage of workers with a potential for exposure to the agent is given in parentheses. This number only includes data obtained at NOHSM sample sites.

Column (6) contains the locations where workers were observed to have a potential for exposure to this agent at the NOHSM sample sites. The percentage of workers in each listed location with a potential exposure to the agent is given in parentheses. This number only includes data obtained at NOHSM sample sites.

MSHA REGULATED CHEMICALS FOUND ON MINE PROPERTY

COMMODITY NAME: BARITE

CHEMICAL NAME	(1) #WORKERS POTENTIALLY EXPOSED (OBSERVED)	(2) #WORKERS POTENTIALLY EXPOSED (PREDICTED)	(3) %WORKERS POTENTIALLY EXPOSED (PREDICTED)	(4) PREDICTED ANNUAL USAGE
ACETYLENE	19	85	20	940,798 GALS.
OCCUPATIONS				
179 BALL, ROD, PEBBLE MILL OPTR (29%)				
649 ADMN, SUPERVISORY, MGT PERSNL (40%)				
604 MECHANIC (81%)				
LOCATIONS				
007 SURFACE GRINDING (50%)				
005 SURFACE SHOP (100%)				
010 SURFACE MILL (17%)				
NITRIC ACID	2	3	1	21 LBS.
OCCUPATIONS				
514 LABORATORY TECHNICIAN (50%)				
LOCATIONS				
009 SURFACE MISC (13%)				
NITROGEN	1	7	2	13,097 LBS.
OCCUPATIONS				
514 LABORATORY TECHNICIAN (25%)				
LOCATIONS				
009 SURFACE MISC (6%)				
PROPANE	21	83	19	5,019 LBS. 61,513 GALS.
OCCUPATIONS				
179 BALL, ROD, PEBBLE MILL OPTR (43%)				
389 FORKLIFT OPTR (100%)				
LOCATIONS				

(CONTINUED NEXT PAGE)

MSHA REGULATED CHEMICALS FOUND ON MINE PROPERTY

COMMODITY NAME: BARITE

CHEMICAL NAME	(1) #WORKERS POTENTIALLY EXPOSED (OBSERVED)	(2) #WORKERS POTENTIALLY EXPOSED (PREDICTED)	(3) %WORKERS POTENTIALLY EXPOSED (PREDICTED)	(4) PREDICTED ANNUAL USAGE
PROPANE (CONTINUED)	21	83	19	5,019 LBS. 61,513 GALS.
(5) OCCUPATIONS			(6) LOCATIONS	
514 LABORATORY TECHNICIAN (25%)			009 SURFACE MISC (31%)	
879 BAGGING OR PACKING WRKR (78%)			010 SURFACE MILL (34%)	
SODIUM HYDROXIDE	1	7	2	147,257 LBS.
(5) OCCUPATIONS			(6) LOCATIONS	
514 LABORATORY TECHNICIAN (25%)			009 SURFACE MISC (6%)	
SULFURIC ACID	3	9	2	373,818 LBS. 7 GALS.
(5) OCCUPATIONS			(6) LOCATIONS	
514 LABORATORY TECHNICIAN (75%)			009 SURFACE MISC (19%)	

CHEMICALS FOUND ON MINE PROPERTY THAT HAVE A NIOSH RECOMMENDED EXPOSURE LIMIT BUT ARE NOT REGULATED BY MSHA

COMMODITY NAME: BARITE

CHEMICAL NAME	(1) #WORKERS POTENTIALLY EXPOSED (OBSERVED)	(2) #WORKERS POTENTIALLY EXPOSED (PREDICTED)	(3) %WORKERS POTENTIALLY EXPOSED (PREDICTED)	(4) PREDICTED ANNUAL USAGE
DIESEL FUEL NO. 2	44	165	38	742,410 GALS.

(5)

OCCUPATIONS

- 079 CRUSHER OPTR (100%)
- 368 BULLDOZER OPTR (100%)
- 514 LABORATORY TECHNICIAN (25%)
- 649 ADMN. SUPERVISORY, MGT PERSNL (40%)
- 782 FRONT-END LOADER OPTR (100%)
- 179 BALL, ROD, PEBBLE MILL OPTR (50%)
- 376 TRUCK DRIVER (78%)
- 604 MECHANIC (81%)
- 678 DRAGLINE OPTR (100%)
- 879 BAGGING OR PACKING WRKR (44%)

(6)

LOCATIONS

- 006 SURFACE CRUSHING (29%)
- 007 SURFACE GRINDING (50%)
- 005 SURFACE SHOP (70%)
- 010 SURFACE MILL (32%)
- 004 SURFACE MINE (71%)
- 009 SURFACE MISC (69%)

CHEMICALS FOUND ON MINE PROPERTY THAT HAVE NO NIOSH RECOMMENDATION OR MSHA EXPOSURE LIMIT

COMMODITY NAME: BARITE

CHEMICAL NAME	(1) #WORKERS POTENTIALLY EXPOSED (OBSERVED)	(2) #WORKERS POTENTIALLY EXPOSED (PREDICTED)	(3) %WORKERS POTENTIALLY EXPOSED (PREDICTED)	(4) PREDICTED ANNUAL USAGE
---------------	---------------------------------------------------------	----------------------------------------------------------	----------------------------------------------------------	-------------------------------------

LIQUEFIED PETROLEUM GAS 3 4 1 16,990 GALS.

(5)
OCCUPATIONS
674 WAREHOUSEMAN; SUPPLY HANDLER (100%) 879 BAGGING OR PACKING WRKR (22%)
LOCATIONS
009 SURFACE MISC (6%)
010 SURFACE MILL (4%)

NATURAL GAS 4 6 1 42005287199 GALS.

(5)
OCCUPATIONS
379 DRYER OPTR; KILN OPTR (100%) 649 ADMN, SUPERVISORY, MGT PERSNL (60%)
LOCATIONS
010 SURFACE MILL (9%)

RUN DATE: 07/25/90

TABLE 4, PAGE 1

NOTE: TRADE SECRET DATA HAVE BEEN EXCLUDED FROM THIS TABLE.

TRADENAME PRODUCTS FOUND ON MINE PROPERTY

COMMODITY NAME: BARITE

MANUFACTURER'S NAME AND TRADENAME PRODUCTS	(1) #WORKERS POTENTIALLY EXPOSED (OBSERVED)	(2) #WORKERS POTENTIALLY EXPOSED (PREDICTED)	(3) %WORKERS POTENTIALLY EXPOSED (PREDICTED)	(4) PREDICTED ANNUAL USAGE
-----------------------------------------------	---------------------------------------------------------	----------------------------------------------------------	----------------------------------------------------------	-------------------------------------

AIRCO INC.

FLEETWELD 5P CLASS E6010

7 46 11 1,310 LBS.

(5)
OCCUPATIONS

179 BALL, ROD, PEBBLE MILL OPTR (29%) 604 MECHANIC (19%)

(6)
LOCATIONS

007 SURFACE GRINDING (50%)
005 SURFACE SHOP (30%)
010 SURFACE MILL (6%)

JET LH-70 CLASS E7018

7 46 11 1,310 LBS.

(5)

OCCUPATIONS

179 BALL, ROD, PEBBLE MILL OPTR (29%) 604 MECHANIC (19%)

(6)

LOCATIONS

007 SURFACE GRINDING (50%)
005 SURFACE SHOP (30%)
010 SURFACE MILL (6%)

AMALIE REFINING COMPANY

MOLY ALL PURPOSE GREASE LI-2M NLGI NO. 2

11 61 14 26,751 LBS.

(5)

OCCUPATIONS

079 CRUSHER OPTR (100%)
604 MECHANIC (19%) 179 BALL, ROD, PEBBLE MILL OPTR (29%)

(6)

LOCATIONS

006 SURFACE CRUSHING (29%)
007 SURFACE GRINDING (50%)
010 SURFACE MILL (6%)

RUN DATE: 07/25/90

TABLE 4, PAGE 2

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TRADENAME PRODUCTS FOUND ON MINE PROPERTY

COMMODITY NAME: BARITE

MANUFACTURER'S NAME AND TRADENAME PRODUCTS	(1) #WORKERS POTENTIALLY EXPOSED (OBSERVED)	(2) #WORKERS POTENTIALLY EXPOSED (PREDICTED)	(3) %WORKERS POTENTIALLY EXPOSED (PREDICTED)	(4) PREDICTED ANNUAL USAGE
AMOCO OIL COMPANY				
AMOCO A.W. OIL NO. 68	5	32	7	1,584 GALS.
(5) OCCUPATIONS				
604 MECHANIC (19%)	728 COMPLETE LOAD/HAUL/DUMP CYCLE (100%)			
(6) LOCATIONS				
			005 SURFACE SHOP (30%)	
			004 SURFACE MINE (14%)	
AMOCO PREMIER DIESEL				
AMOCO PREMIER DIESEL	7	45	10	137,993 GALS.
(5) OCCUPATIONS				
376 TRUCK DRIVER (22%)	604 MECHANIC (19%)			
728 COMPLETE LOAD/HAUL/DUMP CYCLE (100%)				
(6) LOCATIONS				
			005 SURFACE SHOP (30%)	
			004 SURFACE MINE (29%)	
AMOCO RYKON PREMIUM GREASE NO. 2 EP				
AMOCO RYKON PREMIUM GREASE NO. 2 EP	3	19	4	3,067 LBS.
(5) OCCUPATIONS				
604 MECHANIC (19%)	728 COMPLETE LOAD/HAUL/DUMP CYCLE (100%)			
(6) LOCATIONS				
			005 SURFACE SHOP (30%)	
			004 SURFACE MINE (14%)	
AMOCO 300 MOTOR OIL SAE 30				
AMOCO 300 MOTOR OIL SAE 30	5	32	7	351 GALS.
(5) OCCUPATIONS				
604 MECHANIC (19%)	728 COMPLETE LOAD/HAUL/DUMP CYCLE (100%)			
(6) LOCATIONS				
			005 SURFACE SHOP (30%)	
			004 SURFACE MINE (14%)	

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TRADENAME PRODUCTS FOUND ON MINE PROPERTY

COMMODITY NAME: BARITE

MANUFACTURER'S NAME AND TRADENAME PRODUCTS	(1) #WORKERS POTENTIALLY EXPOSED (OBSERVED)	(2) #WORKERS POTENTIALLY EXPOSED (PREDICTED)	(3) %WORKERS POTENTIALLY EXPOSED (PREDICTED)	(4) PREDICTED ANNUAL USAGE
AMOCO OIL COMPANY				
AMOCO 300 MOTOR OIL SAE 40	5	32	7	4,747 GALS.
OCCUPATIONS			(6) LOCATIONS	
604 MECHANIC (19%)		728 COMPLETE LOAD/HAUL/DUMP CYCLE (100%)		005 SURFACE SHOP (30%) 004 SURFACE MINE (14%)
BAY STATE ABRASIVES / DRESSER				
A60 M6 V22 CAT# V5 86	5	14	3	14 LBS.
OCCUPATIONS			(6) LOCATIONS	
604 MECHANIC (19%)		649 ADMN, SUPERVISORY, MGT PERSNL (40%)		010 SURFACE MILL (11%)
BLUE FLASH A24RBF2 FA 324	5	14	3	138 LBS.
OCCUPATIONS			(6) LOCATIONS	
604 MECHANIC (19%)		649 ADMN, SUPERVISORY, MGT PERSNL (40%)		010 SURFACE MILL (11%)

RUN DATE: 07/25/90

TABLE 4, PAGE 4

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TRADENAME PRODUCTS FOUND ON MINE PROPERTY

COMMODITY NAME: BARITE

MANUFACTURER'S NAME AND TRADENAME PRODUCTS	(1) #WORKERS POTENTIALLY EXPOSED (OBSERVED)	(2) #WORKERS POTENTIALLY EXPOSED (PREDICTED)	(3) %WORKERS POTENTIALLY EXPOSED (PREDICTED)	(4) PREDICTED ANNUAL USAGE
BBL / DIV. BECTON, DICKINSON AND COMPANY				
BBL BRAIN HEART INFUSION AGAR 11065	1	3	1	58 LBS.
(5) OCCUPATIONS			(6) LOCATIONS	
514 LABORATORY TECHNICIAN (25%)			009 SURFACE MISC (6%)	
BBL LETHEN AGAR 11341	1	3	1	58 LBS.
(5) OCCUPATIONS			(6) LOCATIONS	
514 LABORATORY TECHNICIAN (25%)			009 SURFACE MISC (6%)	
BBL MACCONKEY AGAR 11390	1	3	1	58 LBS.
(5) OCCUPATIONS			(6) LOCATIONS	
514 LABORATORY TECHNICIAN (25%)			009 SURFACE MISC (6%)	
BBL POTATO DEXTROSE AGAR 11550	1	3	1	58 LBS.
(5) OCCUPATIONS			(6) LOCATIONS	
514 LABORATORY TECHNICIAN (25%)			009 SURFACE MISC (6%)	

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TRADENAME PRODUCTS FOUND ON MINE PROPERTY

COMMODITY NAME: BARITE

MANUFACTURER'S NAME AND TRADENAME PRODUCTS	(1) #WORKERS POTENTIALLY EXPOSED (OBSERVED)	(2) #WORKERS POTENTIALLY EXPOSED (PREDICTED)	(3) %WORKERS POTENTIALLY EXPOSED (PREDICTED)	(4) PREDICTED ANNUAL USAGE
BLACK RIVER PAPER CO., INC.				
DIAMOND FOAM DISINFECTANT FOAM CLEANER (AEROSOL)	1	3	1	6 LBS.
(5) OCCUPATIONS				
514 LABORATORY TECHNICIAN (25%)			(6) LOCATIONS 009 SURFACE MISC (6%)	
DIAMOND SHIELD FURNITURE POLISH (AEROSOL)				
	1	3	1	3 LBS.
(5) OCCUPATIONS				
514 LABORATORY TECHNICIAN (25%)			(6) LOCATIONS 009 SURFACE MISC (6%)	
GC-240 GLASS CLEANER CONCENTRATE				
	7	20	5	3 GALS.
(5) OCCUPATIONS				
514 LABORATORY TECHNICIAN (25%) 879 BAGGING OR PACKING WRKR (33%)			(6) LOCATIONS 009 SURFACE MISC (6%) 010 SURFACE MILL (13%)	
616 LABORER; BULLGANG (50%)				

RUN DATE: 07/25/90

TABLE 4, PAGE 6

NOTE: TRADE SECRET DATA HAVE BEEN EXCLUDED FROM THIS TABLE.

TRADENAME PRODUCTS FOUND ON MINE PROPERTY

COMMODITY NAME: BARITE

MANUFACTURER'S NAME AND TRADENAME PRODUCTS	(1) #WORKERS POTENTIALLY EXPOSED (OBSERVED)	(2) #WORKERS POTENTIALLY EXPOSED (PREDICTED)	(3) %WORKERS POTENTIALLY EXPOSED (PREDICTED)	(4) PREDICTED ANNUAL USAGE
BOSTIK EMHART				
BOSTIK MAINTENANCE AEROSOL PENETRATING OIL NO. MC-12 (AEROSOL)	3	20	5	229 LBS.
(5) OCCUPATIONS				
604 MECHANIC (19%)				
(6) LOCATIONS				
				005 SURFACE SHOP (30%) 010 SURFACE MILL (6%)
NEVER-SEEZ (AEROSOL)				
	3	17	4	11 LBS.
(5) OCCUPATIONS				
604 MECHANIC (19%)				
(6) LOCATIONS				
				010 SURFACE MILL (6%)
CARBO TZUJAN INDUSTRIAL CO., LTD.				
ANCHOR GRINDING WHEEL A 60 P 5 V 1 A	3	20	5	7 LBS.
(5) OCCUPATIONS				
604 MECHANIC (19%)				
(6) LOCATIONS				
				005 SURFACE SHOP (30%)

RUN DATE: 07/25/90

TABLE 4, PAGE 7

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TRADENAME PRODUCTS FOUND ON MINE PROPERTY

COMMODITY NAME: BARITE

MANUFACTURER'S NAME AND TRADENAME PRODUCTS	(1) #WORKERS POTENTIALLY EXPOSED (OBSERVED)	(2) #WORKERS POTENTIALLY EXPOSED (PREDICTED)	(3) %WORKERS POTENTIALLY EXPOSED (PREDICTED)	(4) PREDICTED ANNUAL USAGE
CARGILL, INC.				
CARGILL SOLAR SALT CRYSTALS	3	9	2	55,266 LBS.
OCCUPATIONS			(6) LOCATIONS	
179 BALL, ROD, PEBBLE MILL OPTR (21%)			010 SURFACE MILL (6%)	
CON-LUX COATINGS, INC.				
CON-LUX GLUE FOR LABELS ONLY	7	20	5	9 GALS.
OCCUPATIONS			(6) LOCATIONS	
389 FORKLIFT OPTR (100%) 879 BAGGING OR PACKING WRKR (33%)			010 SURFACE MILL (15%)	
CRC CHEMICALS USA				
CRC LECTRA-MOTIVE CLEANER (AEROSOL)	5	14	3	43 LBS.
OCCUPATIONS			(6) LOCATIONS	
604 MECHANIC (19%)			010 SURFACE MILL (11%)	

NOTE: TRADE SECRET DATA HAVE BEEN EXCLUDED FROM THIS TABLE.

TRADENAME PRODUCTS FOUND ON MINE PROPERTY

COMMODITY NAME: BARITE

MANUFACTURER'S NAME AND TRADENAME PRODUCTS	(1) #WORKERS POTENTIALLY EXPOSED (OBSERVED)	(2) #WORKERS POTENTIALLY EXPOSED (PREDICTED)	(3) %WORKERS POTENTIALLY EXPOSED (PREDICTED)	(4) PREDICTED ANNUAL USAGE
CURTIN MATHESON SCIENTIFIC, INC.				
AMMONIUM HYDROXIDE 830-170	2	3	1	18 LBS.
(5) OCCUPATIONS	-----			
514 LABORATORY TECHNICIAN (50%)	LOCATIONS			
	009 SURFACE MISC (13%)			
HYDROCHLORIC ACID 831-090				
(5) OCCUPATIONS	2	3	1	37 LBS.
514 LABORATORY TECHNICIAN (50%)	-----			
	LOCATIONS			
	009 SURFACE MISC (13%)			
PHOSPHORIC ACID 821-621				
(5) OCCUPATIONS	2	3	1	11 LBS.
514 LABORATORY TECHNICIAN (50%)	-----			
	LOCATIONS			
	009 SURFACE MISC (13%)			
SULFURIC ACID 832-238				
(5) OCCUPATIONS	2	3	1	25 LBS.
514 LABORATORY TECHNICIAN (50%)	-----			
	LOCATIONS			
	009 SURFACE MISC (13%)			

PRINT DATE: 07/25/90

TABLE 4, PAGE 9

NOTE: TRADE SECRET DATA HAVE BEEN EXCLUDED FROM THIS TABLE.

TRADENAME PRODUCTS FOUND ON MINE PROPERTY

COMMODITY NAME: BARITE

	(1) #WORKERS POTENTIALLY EXPOSED (OBSERVED)	(2) #WORKERS POTENTIALLY EXPOSED (PREDICTED)	(3) %WORKERS POTENTIALLY EXPOSED (PREDICTED)	(4) PREDICTED ANNUAL USAGE
D-A LUBRICANT COMPANY INC.				
D-A LITHIUM EXTRA HEAVY	3	19	4	2,300 LBS.
(5) OCCUPATIONS			(6) LOCATIONS	
604 MECHANIC (19%)			005 SURFACE SHOP (30%)	
DIFCO LABORATORIES				
BACTO LETHEN BROTH 0681-01	1	3	1	58 LBS.
(5) OCCUPATIONS			(6) LOCATIONS	
514 LABORATORY TECHNICIAN (25%)			009 SURFACE MISC (6%)	
BACTO VJ AGAR 0562-01-9	1	3	1	58 LBS.
(5) OCCUPATIONS			(6) LOCATIONS	
514 LABORATORY TECHNICIAN (25%)			009 SURFACE MISC (6%)	

NOTE: TRADE SECRET DATA HAVE BEEN EXCLUDED FROM THIS TABLE.

TRADENAME PRODUCTS FOUND ON MINE PROPERTY

COMMODITY NAME: BARITE

MANUFACTURER'S NAME AND TRADENAME PRODUCTS	(1) #WORKERS POTENTIALLY EXPOSED (OBSERVED)	(2) #WORKERS POTENTIALLY EXPOSED (PREDICTED)	(3) %WORKERS POTENTIALLY EXPOSED (PREDICTED)	(4) PREDICTED ANNUAL USAGE
EISEMAN CHEMICAL CO.				
TOTAL HARDNESS INDICATOR SOLUTION	1	7	2	7 GALS.
(5) OCCUPATIONS			(6) LOCATIONS	
514 LABORATORY TECHNICIAN (25%)			009 SURFACE MISC (6%)	
ENGELHARD CORPORATION / SPECIALTY CHEMICALS DIVISION				
SOL SPEEDI DRI ABSORBENT	5	14	3	8,635 LBS.
(5) OCCUPATIONS			(6) LOCATIONS	
604 MECHANIC (19%)			010 SURFACE MILL (11%)	
FINA OIL AND CHEMICAL CO.				
ANTIFREEZE	4	6	1	142 GALS.
(5) OCCUPATIONS			(6) LOCATIONS	
604 MECHANIC (25%)			005 SURFACE SHOP (40%)	

NOTE: TRADE SECRET DATA HAVE BEEN EXCLUDED FROM THIS TABLE.

TRADENAME PRODUCTS FOUND ON MINE PROPERTY

COMMODITY NAME: BARITE

MANUFACTURER'S NAME AND TRADENAME PRODUCTS	(1) #WORKERS POTENTIALLY EXPOSED (OBSERVED)	(2) #WORKERS POTENTIALLY EXPOSED (PREDICTED)	(3) %WORKERS POTENTIALLY EXPOSED (PREDICTED)	(4) PREDICTED ANNUAL USAGE
FINA OIL AND CHEMICAL CO.				
C.T. 30WT MOTOR OIL	7	46	11	3,274 GALS.
(5) OCCUPATIONS				
179 BALL, ROD, PEBBLE MILL OPTR (29%)	604 MECHANIC (19%)		(6) LOCATIONS	
			007 SURFACE GRINDING (50%)	
			005 SURFACE SHOP (30%)	
DEXRON II ATF				
	3	20	5	3,274 GALS.
(5) OCCUPATIONS				
604 MECHANIC (19%)			(6) LOCATIONS	
			005 SURFACE SHOP (30%)	
GASOLINE REGULAR				
	4	6	1	9,911 GALS.
(5) OCCUPATIONS				
649 ADMN, SUPERVISORY, MGT PERSNL (60%)	674 WAREHOUSEMAN; SUPPLY HANDLER (100%)		(6) LOCATIONS	
			010 SURFACE MILL (6%)	
			009 SURFACE MISC (6%)	
MARSON EPL NLGI # 0				
	27	38	9	17,840 LBS.
(5) OCCUPATIONS				
368 BULLDOZER OPTR (100%)	376 TRUCK DRIVER (78%)		(6) LOCATIONS	

(CONTINUED NEXT PAGE)

RUN DATE: 07/25/90

TABLE 4, PAGE 12

NOTE: TRADE SECRET DATA HAVE BEEN EXCLUDED FROM THIS TABLE.

TRADENAME PRODUCTS FOUND ON MINE PROPERTY

COMMODITY NAME: BARITE

MANUFACTURER'S NAME AND TRADENAME PRODUCTS	(1) #WORKERS POTENTIALLY EXPOSED (OBSERVED)	(2) #WORKERS POTENTIALLY EXPOSED (PREDICTED)	(3) %WORKERS POTENTIALLY EXPOSED (PREDICTED)	(4) PREDICTED ANNUAL USAGE
FINA OIL AND CHEMICAL CO.				
MARSON EPL NLGI # 0 (CONTINUED)	27	38	9	17,840 LBS.
(5)				
OCCUPATIONS	(6) LOCATIONS			
488 DRY SCREENING PLANT OPTR (100%)	005 SURFACE SHOP (40%)			
613 CLEANUP MAN (100%)	010 SURFACE MILL (21%)			
782 FRONT-END LOADER OPTR (100%)	004 SURFACE MINE (71%)			
	009 SURFACE MISC (19%)			
MARSON LITHIUM NLSI # 2				
(5)				
OCCUPATIONS	(6) LOCATIONS			
368 BULLDOZER OPTR (100%)	004 SURFACE MINE (14%)			
679 FLOTATION/CONCTR OPTR (100%)	010 SURFACE MILL (15%)			
MOTOR OIL SAE 10				
(5)				
OCCUPATIONS	(6) LOCATIONS			
604 MECHANIC (25%)	005 SURFACE SHOP (40%)			
	1			
	425 GALS.			

TRADENAME PRODUCTS FOUND ON MINE PROPERTY

COMMODITY NAME: BARITE

MANUFACTURER'S NAME AND TRADENAME PRODUCTS	(1) #WORKERS POTENTIALLY EXPOSED (OBSERVED)	(2) #WORKERS POTENTIALLY EXPOSED (PREDICTED)	(3) %WORKERS POTENTIALLY EXPOSED (PREDICTED)	(4) PREDICTED ANNUAL USAGE
FINA OIL AND CHEMICAL CO. N-GEAR-221	7	46	11	5,239 GALS.
OCCUPATIONS				
179 BALL, ROD, PEBBLE MILL OPTR (29%)	604 MECHANIC (19%)		007 SURFACE GRINDING (50%) 010 SURFACE MILL (6%)	
SAE 80W-90 PONTONIC MPX GEAR OIL	6	8	2	326 GALS.
OCCUPATIONS				
379 DRYER OPTR; KILN OPTR (100%)	604 MECHANIC (25%)		005 SURFACE SHOP (40%) 010 SURFACE MILL (4%)	
UNIVERSAL MOTOR OIL SAE 30	16	23	5	425 GALS.
OCCUPATIONS				
368 BULLDOZER OPTR (100%)	376 TRUCK DRIVER (78%)		004 SURFACE MINE (64%) 005 SURFACE SHOP (40%) 009 SURFACE MISC (19%)	
604 MECHANIC (25%)	782 FRONT-END LOADER OPTR (100%)			

RUN DATE: 07/25/90

TABLE 4, PAGE 14

NOTE: TRADE SECRET DATA HAVE BEEN EXCLUDED FROM THIS TABLE.

TRADENAME PRODUCTS FOUND ON MINE PROPERTY

COMMODITY NAME: BARITE

MANUFACTURER'S NAME AND TRADENAME PRODUCTS	(1) #WORKERS POTENTIALLY EXPOSED (OBSERVED)	(2) #WORKERS POTENTIALLY EXPOSED (PREDICTED)	(3) %WORKERS POTENTIALLY EXPOSED (PREDICTED)	(4) PREDICTED ANNUAL USAGE
FISHER SCIENTIFIC CO.				
HYDROCHLORIC ACID A-144	2	3	1	71 LBS.
(5) OCCUPATIONS				
514 LABORATORY TECHNICIAN (50%)				
GENERAL PAINT & CHEMICAL CO. / COTTER & COMPANY				
TRU-TEST READY MIXED ALUMINUM PAINT INTERIOR EXTERIOR AL-2	5	14	3	14 GALS.
(5) OCCUPATIONS				
604 MECHANIC (19%)				
649 ADMN, SUPERVISORY, MGT PERSNL (40%)				
(6) OCCUPATIONS				
010 SURFACE MILL (11%)				
60-JO INDUSTRIES INC,				
60-JO HAND CLEANER ORIGINAL FORMULA	3	19	4	575 LBS.
(5) OCCUPATIONS				
604 MECHANIC (19%)				
(6) OCCUPATIONS				
005 SURFACE SHOP (30%)				

NOTE: TRADE SECRET DATA HAVE BEEN EXCLUDED FROM THIS TABLE.

TRADENAME PRODUCTS FOUND ON MINE PROPERTY

COMMODITY NAME: BARITE

MANUFACTURER'S NAME AND TRADENAME PRODUCTS	(1) #WORKERS POTENTIALLY EXPOSED (OBSERVED)	(2) #WORKERS POTENTIALLY EXPOSED (PREDICTED)	(3) %WORKERS POTENTIALLY EXPOSED (PREDICTED)	(4) PREDICTED ANNUAL USAGE
GULF OIL CORP.				
GULF HARMONY 150	5	14	3	317 GALS.
(5) OCCUPATIONS				
604 MECHANIC (19%)	649 ADMN, SUPERVISORY, MGT PERSNL (40%)			
GULF MPGL SAE 80W/90				
(5) OCCUPATIONS	5	14	3	633 GALS.
604 MECHANIC (19%)	649 ADMN, SUPERVISORY, MGT PERSNL (40%)			
SUPER DUTY MOTOR OIL SAE 30				
(5) OCCUPATIONS	5	14	3	633 GALS.
604 MECHANIC (19%)	649 ADMN, SUPERVISORY, MGT PERSNL (40%)			

RUN DATE: 07/25/90

TABLE 4, PAGE 16

NOTE: TRADE SECRET DATA HAVE BEEN EXCLUDED FROM THIS TABLE.

TRADENAME PRODUCTS FOUND ON MINE PROPERTY

COMMODITY NAME: BARITE

MANUFACTURER'S NAME AND TRADENAME PRODUCTS	(1) #WORKERS POTENTIALLY EXPOSED (OBSERVED)	(2) #WORKERS POTENTIALLY EXPOSED (PREDICTED)	(3) %WORKERS POTENTIALLY EXPOSED (PREDICTED)	(4) PREDICTED ANNUAL USAGE
HOLT LLOYD CORP.				
LPS 2 GENERAL PURPOSE LUBRICANT PART NO. 00218 (AEROSOL)	3	20	5	52 LBS.
(5) OCCUPATIONS				
604 MECHANIC (19%)				
(6) LOCATIONS				
005 SURFACE SHOP (30%)				
010 SURFACE MILL (6%)				
KEMKO, INC.				
FORMULA 69 C	1	1	<1	234 GALS.
(5) OCCUPATIONS				
379 DRYER OPTR; KILN OPTR (100%)				
(6) LOCATIONS				
010 SURFACE MILL (2%)				
269-C				
(5) OCCUPATIONS				
379 DRYER OPTR; KILN OPTR (100%)				
(6) LOCATIONS				
010 SURFACE MILL (2%)				

RUN DATE: 07/25/90

TABLE 4, PAGE 17

NOTE: TRADE SECRET DATA HAVE BEEN EXCLUDED FROM THIS TABLE.

TRADENAME PRODUCTS FOUND ON MINE PROPERTY

COMMODITY NAME: BARITE

MANUFACTURER'S NAME AND TRADENAME PRODUCTS	(1) #WORKERS POTENTIALLY EXPOSED (OBSERVED)	(2) #WORKERS POTENTIALLY EXPOSED (PREDICTED)	(3) %WORKERS POTENTIALLY EXPOSED (PREDICTED)	(4) PREDICTED ANNUAL USAGE
KEMKO, INC.	1	1	<1	234 GALS.
653 BWT				
(5) OCCUPATIONS			(6) LOCATIONS	
379 DRYER OPTR; KILN OPTR (100%)			010 SURFACE MILL (2%)	
LINCOLN ELECTRIC CO.				
E6011	4	6	1	142 LBS.
(5) OCCUPATIONS			(6) LOCATIONS	
604 MECHANIC (25%)			005 SURFACE SHOP (40%)	
MILPARK DRILLING FLUIDS CO. / BAKER HUGHES				
TSSP	4	26	6	7 LBS.
(5) OCCUPATIONS			(6) LOCATIONS	
179 BALL, ROD, PEBBLE MILL OPTR (29%)			007 SURFACE GRINDING (50%)	

TRADENAME PRODUCTS FOUND ON MINE PROPERTY

COMMODITY NAME: BARITE

MANUFACTURER'S NAME AND TRADENAME PRODUCTS	(1) #WORKERS POTENTIALLY EXPOSED (OBSERVED)	(2) #WORKERS POTENTIALLY EXPOSED (PREDICTED)	(3) %WORKERS POTENTIALLY EXPOSED (PREDICTED)	(4) PREDICTED ANNUAL USAGE
MOBIL OIL CORPORATION				
MOBIL 634	7	39	9	1,839 GALS.
(5) OCCUPATIONS				
179 BALL, ROD, PEBBLE MILL OPTR (29%)	604 MECHANIC (19%)		007 SURFACE GRINDING (50%) 010 SURFACE MILL (6%)	
MOBIL 797				
	3	17	4	1,226 GALS.
(5) OCCUPATIONS				
604 MECHANIC (19%)			010 SURFACE MILL (6%)	
MOBILE OIL AA				
	7	39	9	3,678 GALS.
(5) OCCUPATIONS				
179 BALL, ROD, PEBBLE MILL OPTR (29%)	604 MECHANIC (19%)		007 SURFACE GRINDING (50%) 010 SURFACE MILL (6%)	
MOBILUX EP 1 GREASE				
	14	78	18	1,338 LBS.
(5) OCCUPATIONS				
079 CRUSHER OPTR (100%)	179 BALL, ROD, PEBBLE MILL OPTR (29%)		006 SURFACE CRUSHING (29%) 007 SURFACE GRINDING (50%)	

(CONTINUED NEXT PAGE)

RUN DATE: 07/25/90

TABLE 4, PAGE 19

NOTE: TRADE SECRET DATA HAVE BEEN EXCLUDED FROM THIS TABLE.

TRADENAME PRODUCTS FOUND ON MINE PROPERTY

COMMODITY NAME: BARITE

MANUFACTURER'S NAME AND TRADENAME PRODUCTS	(1) #WORKERS POTENTIALLY EXPOSED (OBSERVED)	(2) #WORKERS POTENTIALLY EXPOSED (PREDICTED)	(3) %WORKERS POTENTIALLY EXPOSED (PREDICTED)	(4) PREDICTED ANNUAL USAGE
-----------------------------------------------	---------------------------------------------------------	----------------------------------------------------------	----------------------------------------------------------	-------------------------------------

MOBIL OIL CORPORATION

MOBILUX EP 1 GREASE
(CONTINUED)

14

78

18

1,338 LBS.

(5)
OCCUPATIONS

(6)
LOCATIONS

604 MECHANIC (19%)

616 LABORER; BULLGANG (50%)

010 SURFACE MILL (13%)

OFITE

VERSENATE HARDNESS BUFFER SOLUTION NO. 205-05

1

7

2

7 GALS.

(5)
OCCUPATIONS

(6)
LOCATIONS

514 LABORATORY TECHNICIAN (25%)

009 SURFACE MISC (6%)

VERSENATE HARDNESS TITRATING SOLUTION NO.
205-12

1

7

2

7 GALS.

(5)
OCCUPATIONS

(6)
LOCATIONS

514 LABORATORY TECHNICIAN (25%)

009 SURFACE MISC (6%)

TRADENAME PRODUCTS FOUND ON MINE PROPERTY

COMMODITY NAME: BARITE

MANUFACTURER'S NAME AND TRADENAME PRODUCTS	(1) #WORKERS POTENTIALLY EXPOSED (OBSERVED)	(2) #WORKERS POTENTIALLY EXPOSED (PREDICTED)	(3) %WORKERS POTENTIALLY EXPOSED (PREDICTED)	(4) PREDICTED ANNUAL USAGE
OLIN CHEMICALS				
POLYPHOS SODIUM HEXAMETA PHOSPHATE	4	6	1	14,725 LBS.
(5) OCCUPATIONS				
379 DRYER OPTR; KILN OPTR (100%)			(6) LOCATIONS	
879 BAGGING OR PACKING WRKR (22%)			010 SURFACE MILL (9%)	
PROCTOR & GAMBLE				
DAWN DISHWASHING DETERGENT	1	3	1	3 GALS.
(5) OCCUPATIONS				
514 LABORATORY TECHNICIAN (25%)			(6) LOCATIONS	
PYROIL COMPANY				
PYROIL STARTING FLUID STOCK NO. AOK-16 (AEROSOL)	2	13	3	268 LBS.
(5) OCCUPATIONS				
376 TRUCK DRIVER (22%)			(6) LOCATIONS	
			004 SURFACE MINE (14%)	

RUN DATE: 07/25/90

TABLE 4, PAGE 21

NOTE: TRADE SECRET DATA HAVE BEEN EXCLUDED FROM THIS TABLE.

TRADENAME PRODUCTS FOUND ON MINE PROPERTY

COMMODITY NAME: BARITE

MANUFACTURER'S NAME AND TRADENAME PRODUCTS	(1) #WORKERS POTENTIALLY EXPOSED (OBSERVED)	(2) #WORKERS POTENTIALLY EXPOSED (PREDICTED)	(3) %WORKERS POTENTIALLY EXPOSED (PREDICTED)	(4) PREDICTED ANNUAL USAGE

SANI-FRESH INTERNATIONAL

SANI-TUFF WATERLESS CLEANSER WITH GRIT

12 79 18 124 GALS.

(5)
OCCUPATIONS

179 BALL, ROD, PEBBLE MILL OPTR (29%)
604 MECHANIC (19%)

514 LABORATORY TECHNICIAN (25%)
879 BAGGING OR PACKING WRKR (44%)

(6)
LOCATIONS

007 SURFACE GRINDING (50%)
005 SURFACE SHOP (30%)
010 SURFACE MILL (9%)
009 SURFACE MISC (31%)

SHELL OIL COMPANY

ROTELLA OIL 20W/20

11 61 14 7,357 GALS.

(5)
OCCUPATIONS

079 CRUSHER OPTR (100%)
604 MECHANIC (19%)

179 BALL, ROD, PEBBLE MILL OPTR (29%)

(6)
LOCATIONS

006 SURFACE CRUSHING (29%)
007 SURFACE GRINDING (50%)
010 SURFACE MILL (6%)

STOODY CO.

NICRO-MANG

4 6 1 142 LBS.

(5)
OCCUPATIONS

604 MECHANIC (25%)

(6)
LOCATIONS

005 SURFACE SHOP (40%)

TRADENAME PRODUCTS FOUND ON MINE PROPERTY

COMMODITY NAME: BARITE

MANUFACTURER'S NAME AND TRADENAME PRODUCTS	(1) #WORKERS POTENTIALLY EXPOSED (OBSERVED)	(2) #WORKERS POTENTIALLY EXPOSED (PREDICTED)	(3) %WORKERS POTENTIALLY EXPOSED (PREDICTED)	(4) PREDICTED ANNUAL USAGE
-----------------------------------------------	---------------------------------------------------------	----------------------------------------------------------	----------------------------------------------------------	-------------------------------------

SUN REFINING AND MARKETING COMPANY

SUNVIS 968 ISO GRADE 68

7

46

11

3,274 GALS.

(5)

OCCUPATIONS

179 BALL, ROD, PEBBLE MILL OPTR (29%) 604 MECHANIC (19%)

(6)

LOCATIONS

007 SURFACE GRINDING (50%)
005 SURFACE SHOP (30%)
010 SURFACE MILL (6%)

SUNNYSIDE CORPORATION / CONSUMER PRODUCTS DIVISION

DENATURED ALCOHOL SOLVENT

1

3

1

46 GALS.

(5)

OCCUPATIONS

514 LABORATORY TECHNICIAN (25%)

(6)

LOCATIONS

009 SURFACE MISC (6%)

TEXACO OIL COMPANY

PREMIUM UNLEADED GASOLINE

3

17

4

40,127 GALS.

(5)

OCCUPATIONS

604 MECHANIC (19%)

(6)

LOCATIONS

010 SURFACE MILL (6%)

NOTE: TRADE SECRET DATA HAVE BEEN EXCLUDED FROM THIS TABLE.

TRADENAME PRODUCTS FOUND ON MINE PROPERTY

COMMODITY NAME: BARITE

MANUFACTURER'S NAME AND TRADENAME PRODUCTS	(1) #WORKERS POTENTIALLY EXPOSED (OBSERVED)	(2) #WORKERS POTENTIALLY EXPOSED (PREDICTED)	(3) %WORKERS POTENTIALLY EXPOSED (PREDICTED)	(4) PREDICTED ANNUAL USAGE
-----------------------------------------------	---------------------------------------------------------	----------------------------------------------------------	----------------------------------------------------------	-------------------------------------

THE AMERICAN LUBRICANTS COMPANY

MOLY-TEMP	5	14	3	63 LBS.
(5) OCCUPATIONS			(6) LOCATIONS	
604 MECHANIC (19%)			010 SURFACE MILL (11%)	

THE LINCOLN ELECTRIC CO.

FLEETWELD 35 CLASS E6011	5	14	3	144 LBS.
(5) OCCUPATIONS			(6) LOCATIONS	
604 MECHANIC (19%)			010 SURFACE MILL (11%)	

FLEETWELD 35 6011

(5) OCCUPATIONS	3	19	4	2,555 LBS.
604 MECHANIC (19%)			(6) LOCATIONS	
			005 SURFACE SHOP (30%)	

JETWELD LH-70 CLASS E7018

(5) OCCUPATIONS	5	14	3	144 LBS.
604 MECHANIC (19%)			(6) LOCATIONS	
			010 SURFACE MILL (11%)	

NOTE: TRADE SECRET DATA HAVE BEEN EXCLUDED FROM THIS TABLE.

TRADENAME PRODUCTS FOUND ON MINE PROPERTY

COMMODITY NAME: BARITE

MANUFACTURER'S NAME AND TRADENAME PRODUCTS	(1) #WORKERS POTENTIALLY EXPOSED (OBSERVED)	(2) #WORKERS POTENTIALLY EXPOSED (PREDICTED)	(3) %WORKERS POTENTIALLY EXPOSED (PREDICTED)	(4) PREDICTED ANNUAL USAGE

THE LINCOLN ELECTRIC CO.

STAINWELD 3082-16 CLASS E308L-16

5 14 3 144 LBS.

(5)
OCCUPATIONS

(6)
LOCATIONS

604 MECHANIC (19%)

649 ADMN, SUPERVISORY, MGT PERSNL (40%)
010 SURFACE MILL (11%)

THE M.E. AVERY COMPANY MILL WELDING SUPPLY

PROTEX-SPRAY ANTI-SPATTER PLUS GUN PROTECTOR (AEROSOL)

5 14 3 12 LBS.

(5)
OCCUPATIONS

(6)
LOCATIONS

604 MECHANIC (19%)

649 ADMN, SUPERVISORY, MGT PERSNL (40%)
010 SURFACE MILL (11%)

THIRD COAST PRODUCTS

RLC-726 RED GREASE

7 46 11 393 LBS.

(5)
OCCUPATIONS

(6)
LOCATIONS

179 BALL, ROD, PEBBLE MILL OPTR (29%)

604 MECHANIC (19%)

007 SURFACE GRINDING (50%)
010 SURFACE MILL (6%)

TRADENAME PRODUCTS FOUND ON MINE PROPERTY

COMMODITY NAME: BARITE

MANUFACTURER'S NAME AND TRADENAME PRODUCTS	(1) #WORKERS POTENTIALLY EXPOSED (OBSERVED)	(2) #WORKERS POTENTIALLY EXPOSED (PREDICTED)	(3) %WORKERS POTENTIALLY EXPOSED (PREDICTED)	(4) PREDICTED ANNUAL USAGE
THIRD COAST PRODUCTS				
RLC-728 MOLY GREASE	4	26	6	393 LBS.
(5) OCCUPATIONS				
179 BALL, ROD, PEBBLE MILL OPTR (29%)				
TRANS GULF INDUSTRIES, INC.				
HERCULES 171	3	17	4	1,226 GALS.
(5) OCCUPATIONS				
604 MECHANIC (19%)				
UNI-LOCK SYSTEMS DIV. / KEY TECH CORP.				
LOCK N' POP A	7	20	5	1,583 GALS.
(5) OCCUPATIONS				
389 FORKLIFT OPTR (100%)				
879 BAGGING OR PACKING WRKR (33%)				
616 LABORER; BULLGANG (50%)				
(6) LOCATIONS				
010 SURFACE MILL (15%)				
(6) LOCATIONS				
010 SURFACE MILL (6%)				

RUN DATE: 07/25/90

TABLE 4, PAGE 26

NOTE: TRADE SECRET DATA HAVE BEEN EXCLUDED FROM THIS TABLE.

TRADENAME PRODUCTS FOUND ON MINE PROPERTY

COMMODITY NAME: BARITE

MANUFACTURER'S NAME AND TRADENAME PRODUCTS	(1) #WORKERS POTENTIALLY EXPOSED (OBSERVED)	(2) #WORKERS POTENTIALLY EXPOSED (PREDICTED)	(3) %WORKERS POTENTIALLY EXPOSED (PREDICTED)	(4) PREDICTED ANNUAL USAGE
UNION CARBIDE CORPORATION / LINDE DIVISION				
L-TEC WELDING WIRE	5	14	3	1,439 LBS.
(5) OCCUPATIONS	(6) LOCATIONS			
604 MECHANIC (19%)	649 ADMN, SUPERVISORY, MGT PERSNL (40%) 010 SURFACE MILL (11%)			
25% CARBON DIOXIDE 75% ARGON	5	14	3	77,511 LBS.
(5) OCCUPATIONS	(6) LOCATIONS			
604 MECHANIC (19%)	649 ADMN, SUPERVISORY, MGT PERSNL (40%) 010 SURFACE MILL (11%)			
UNITED ABRASIVES, INC.				
SAIT A24N TYPE 27 GRINDING DISC	3	20	5	118 LBS.
(5) OCCUPATIONS	(6) LOCATIONS			
604 MECHANIC (19%)	010 SURFACE MILL (6%)			

RUN DATE: 07/25/90

TABLE 4, PAGE 27

NOTE: TRADE SECRET DATA HAVE BEEN EXCLUDED FROM THIS TABLE.

TRADENAME PRODUCTS FOUND ON MINE PROPERTY

COMMODITY NAME: BARITE

MANUFACTURER'S NAME AND TRADENAME PRODUCTS	(1) #WORKERS POTENTIALLY EXPOSED (OBSERVED)	(2) #WORKERS POTENTIALLY EXPOSED (PREDICTED)	(3) %WORKERS POTENTIALLY EXPOSED (PREDICTED)	(4) PREDICTED ANNUAL USAGE
WD-40 COMPANY				
WD-40 (AEROSOL)	11	48	11	706 LBS.
(5) OCCUPATIONS			(6) LOCATIONS	
604 MECHANIC (38%)				
649 ADMN, SUPERVISORY, MGT PERSNL (40%)				010 SURFACE MILL (23%)
WEBER MARKING SYSTEMS				
PREMIUM QUALITY INK PT#601246	7	20	5	3 GALS.
(5) OCCUPATIONS			(6) LOCATIONS	
389 FORKLIFT OPTR (100%)				
879 BAGGING OR PACKING WRKR (33%)				010 SURFACE MILL (15%)
WEST PENN OIL CO., INC.				
EMBLEM LUBRICANTS NON DET 50	6	17	4	14 GALS.
(5) OCCUPATIONS			(6) LOCATIONS	
179 BALL, ROD, PEBBLE MILL OPTR (43%)				006 SURFACE CRUSHING (43%)

NOTE: TRADE SECRET DATA HAVE BEEN EXCLUDED FROM THIS TABLE.

TRADENAME PRODUCTS FOUND ON MINE PROPERTY

COMMODITY NAME: BARITE

MANUFACTURER'S NAME AND TRADENAME PRODUCTS	(1) #WORKERS POTENTIALLY EXPOSED (OBSERVED)	(2) #WORKERS POTENTIALLY EXPOSED (PREDICTED)	(3) %WORKERS POTENTIALLY EXPOSED (PREDICTED)	(4) PREDICTED ANNUAL USAGE
WOLF'S HEAD OIL COMPANY				
TRACTOR H-T FLUID	5	14	3	633 GALS.
(5) OCCUPATIONS			(6) LOCATIONS	
604 MECHANIC (19%)				010 SURFACE MILL (11%)
WOLFE'S HEAD SUPER-DUTY AND WHEEL BEARING LUBE	5	14	3	6 LBS.
(5) OCCUPATIONS			(6) LOCATIONS	
604 MECHANIC (19%)				010 SURFACE MILL (11%)

PHYSICAL AGENT CONDITIONS IDENTIFIED ON MINE PROPERTY

COMMODITY NAME: BARITE

(3)
#WORKERS
POTENTIALLY
EXPOSED
(PREDICTED)

(2)
#WORKERS
POTENTIALLY
EXPOSED
(PREDICTED)

(1)
#WORKERS
POTENTIALLY
EXPOSED
(OBSERVED)

70

299

87

NOISE

(5)
OCCUPATIONS

079 CRUSHER OPTR (100%)
368 BULLDOZER OPTR (100%)
379 DRYER OPTR; KILN OPTR (100%)
488 DRY SCREENING PLANT OPTR (100%)
588 SIZING AND WASHING OPNS WRKR (100%)
613 CLEANUP MAN (100%)
649 ADMN, SUPERVISORY, MGT PERSNL (100%)
678 DRAGLINE OPTR (100%)
728 COMPLETE LOAD/HAUL/DUMP CYCLE (100%)
879 BAGGING OR PACKING WRKR (100%)

(6)
LOCATIONS

006 SURFACE CRUSHING (100%)
007 SURFACE GRINDING (100%)
005 SURFACE SHOP (40%)
004 SURFACE MINE (100%)
009 SURFACE MISC (88%)
010 SURFACE MILL (100%)

SEGMENTAL BODY VIBRATION

(5)
OCCUPATIONS

604 MECHANIC (56%)

(6)
LOCATIONS

005 SURFACE SHOP (30%)
010 SURFACE MILL (17%)

TEMPERATURE (PROCESS RELATED)

(5)
OCCUPATIONS

179 BALL, ROD, PEBBLE MILL OPTR (43%)
604 MECHANIC (19%)

(6)
LOCATIONS

010 SURFACE MILL (21%)

10

43

11

53

12

10

PHYSICAL AGENT CONDITIONS IDENTIFIED ON MINE PROPERTY

COMMODITY NAME: BARITE

(1) #WORKERS POTENTIALLY EXPOSED (OBSERVED)	(2) #WORKERS POTENTIALLY EXPOSED (PREDICTED)	(3) %WORKERS POTENTIALLY EXPOSED (PREDICTED)
---------------------------------------------------------	----------------------------------------------------------	----------------------------------------------------------

PHYSICAL AGENT CONDITION

WHOLE BODY VIBRATION

12

52

(5)

(6)

OCCUPATIONS

LOCATIONS

179 BALL, ROD, PEBBLE MILL OPTR (29%)
604 MECHANIC (19%)

514 LABORATORY TECHNICIAN (25%)

006 SURFACE CRUSHING (29%)
007 SURFACE GRINDING (50%)
009 SURFACE MISC (25%)
010 SURFACE MILL (9%)

32

RUN DATE: 07/25/90

TABLE 6, PAGE 1

NOTE: THIS TABLE DOES NOT CONTAIN TRADE SECRET DATA.

MUSCULOSKELETAL OVERLOAD CONDITIONS IDENTIFIED ON MINE PROPERTY

COMMODITY NAME: BARITE

	(1) #WORKERS POTENTIALLY EXPOSED (OBSERVED)	(2) #WORKERS POTENTIALLY EXPOSED (PREDICTED)	(3) %WORKERS POTENTIALLY EXPOSED (PREDICTED)
MUSCULOSKELETAL CONDITION	30	151	35
AWKWARD LIFTING			
(5) OCCUPATIONS			(6) LOCATIONS
079 CRUSHER OPTR (100%)			006 SURFACE CRUSHING (29%)
389 FORKLIFT OPTR (100%)			007 SURFACE GRINDING (100%)
616 LABORER; BULLGANG (50%)			009 SURFACE MISC (25%)
879 BAGGING OR PACKING WRKR (67%)			010 SURFACE MILL (30%)
FOREARM, ARM, AND SHOULDER	25	84	20
(5) OCCUPATIONS			(6) LOCATIONS
179 BALL, ROD, PEBBLE MILL OPTR (29%)			007 SURFACE GRINDING (50%)
613 CLEANUP MAN (100%)			005 SURFACE SHOP (40%)
649 ADMN, SUPERVISORY, MGT PERSNL (40%)			010 SURFACE MILL (36%)
DIMINISHED LIGHT	7	46	11
(5) OCCUPATIONS			(6) LOCATIONS
179 BALL, ROD, PEBBLE MILL OPTR (29%)			007 SURFACE GRINDING (50%)
			010 SURFACE MILL (6%)

MUSCULOSKELETAL OVERLOAD CONDITIONS IDENTIFIED ON MINE PROPERTY

COMMODITY NAME: BARITE

(1) #WORKERS POTENTIALLY EXPOSED (OBSERVED)
(2) #WORKERS POTENTIALLY EXPOSED (PREDICTED)
(3) %WORKERS POTENTIALLY EXPOSED (PREDICTED)

MUSCULOSKELETAL CONDITION

FINGER AND HANDS

(5)

OCCUPATIONS

604 MECHANIC (38%)

649 ADMN, SUPERVISORY, MGT PERSNL (40%)

8

34

8

(6) LOCATIONS

005 SURFACE SHOP (30%)
010 SURFACE MILL (17%)

FREQUENT LIFTING

(5)

OCCUPATIONS

879 BAGGING OR PACKING WRKR (67%)

6

29

7

(6) LOCATIONS

009 SURFACE MISC (25%)
010 SURFACE MILL (4%)

HEAVY LIFTING

(5)

OCCUPATIONS

079 CRUSHER OPTR (100%)
379 DRYER OPTR; KILN OPTR (100%)
488 DRY SCREENING PLANT OPTR (100%)
616 LABORER; BULLGANG (50%)
679 FLOTATION/CONCTR OPTR (100%)

179 BALL, ROD, PEBBLE MILL OPTR (57%)
389 FORKLIFT OPTR (100%)
604 MECHANIC (63%)
649 ADMN, SUPERVISORY, MGT PERSNL (40%)
879 BAGGING OR PACKING WRKR (67%)

42

168

39

(6) LOCATIONS

006 SURFACE CRUSHING (29%)
007 SURFACE GRINDING (100%)
005 SURFACE SHOP (40%)
009 SURFACE MISC (25%)
010 SURFACE MILL (47%)

34

RUN DATE: 07/25/90

TABLE 6, PAGE 3

NOTE: THIS TABLE DOES NOT CONTAIN TRADE SECRET DATA.

MUSCULOSKELETAL OVERLOAD CONDITIONS IDENTIFIED ON MINE PROPERTY

COMMODITY NAME: BARITE

MUSCULOSKELETAL CONDITION	(1) #WORKERS POTENTIALLY EXPOSED (OBSERVED)	(2) #WORKERS POTENTIALLY EXPOSED (PREDICTED)	(3) %WORKERS POTENTIALLY EXPOSED (PREDICTED)
LOWER LIMB	12	60	14

OCCUPATIONS			(6) LOCATIONS
179 BALL, ROD, PEBBLE MILL OPTR (29%)	604 MECHANIC (38%)		007 SURFACE GRINDING (50%)
649 ADMN, SUPERVISORY, MGT PERSNL (40%)			005 SURFACE SHOP (30%)
			010 SURFACE MILL (11%)

LOWER LIMB

12

60

14

(5)

(6)

OCCUPATIONS

LOCATIONS

179 BALL, ROD, PEBBLE MILL OPTR (29%)

604 MECHANIC (38%)

007 SURFACE GRINDING (50%)
005 SURFACE SHOP (30%)
010 SURFACE MILL (11%)

NECK AND/OR BACK

39

172

40

(5)

(6)

OCCUPATIONS

LOCATIONS

079 CRUSHER OPTR (100%)
604 MECHANIC (100%)
616 LABORER; BULLGANG (50%)
879 BAGGING OR PACKING WRKR (22%)

179 BALL, ROD, PEBBLE MILL OPTR (57%)
613 CLEANUP MAN (100%)
649 ADMN, SUPERVISORY, MGT PERSNL (40%)

006 SURFACE CRUSHING (29%)
007 SURFACE GRINDING (100%)
005 SURFACE SHOP (100%)
010 SURFACE MILL (43%)

PRONE OR SUPINE LYING

3

20

5

(5)

(6)

OCCUPATIONS

LOCATIONS

604 MECHANIC (19%)

005 SURFACE SHOP (30%)

STANDING

4

6

1

(5)

(6)

OCCUPATIONS

LOCATIONS

613 CLEANUP MAN (100%)

010 SURFACE MILL (9%)

MUSCULOSKELETAL OVERLOAD CONDITIONS IDENTIFIED ON MINE PROPERTY

COMMODITY NAME: BARITE

MUSCULOSKELETAL CONDITION	(1) #WORKERS POTENTIALLY EXPOSED (OBSERVED)	(2) #WORKERS POTENTIALLY EXPOSED (PREDICTED)	(3) %WORKERS POTENTIALLY EXPOSED (PREDICTED)	(6) LOCATIONS
SITTING	15	73	17	
(5) OCCUPATIONS				
179 BALL, ROD, PEBBLE MILL OPTR (29%)				009 SURFACE MISC (50%)
616 LABORER; BULLGANG (50%)				010 SURFACE MILL (15%)
WRIST	8	34	8	
(5) OCCUPATIONS				
604 MECHANIC (38%)				005 SURFACE SHOP (30%)
				010 SURFACE MILL (17%)

WELDING POTENTIAL EXPOSURE

COMMODITY NAME: BARITE

WELDING PROCESS	(1) #WORKERS POTENTIALLY EXPOSED (OBSERVED)	(2) #WORKERS POTENTIALLY EXPOSED (PREDICTED)	(3) %WORKERS POTENTIALLY EXPOSED (PREDICTED)	(6) LOCATIONS
SHIELD METAL ARC WELDING	19	85	20	
(5) OCCUPATIONS				
179 BALL, ROD, PEBBLE MILL OPTR (29%)	604 MECHANIC (81%)			007 SURFACE GRINDING (50%)
649 ADMN, SUPERVISORY, MGT PERSNL (40%)				005 SURFACE SHOP (100%)
				010 SURFACE MILL (17%)
ELECTROGAS WELDING	5	14	3	
(5) OCCUPATIONS				
604 MECHANIC (19%)	649 ADMN, SUPERVISORY, MGT PERSNL (40%)			010 SURFACE MILL (11%)
OXYFUEL GAS CUTTING	19	85	20	
(5) OCCUPATIONS				
179 BALL, ROD, PEBBLE MILL OPTR (29%)	604 MECHANIC (81%)			007 SURFACE GRINDING (50%)
649 ADMN, SUPERVISORY, MGT PERSNL (40%)				005 SURFACE SHOP (100%)
				010 SURFACE MILL (17%)

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16. Abstract (Limit: 200 words) This report provides data concerning the potential occupational exposure of individuals involved in the mining of barite. Five sample sites were selected from the active barite mining facilities. All of these five sites were surveyed between June 1988 and May 1989. This report identifies potential exposures and provides the associated numbers of workers, the occupations of those workers, and the locations on the mining property where the potential exposures were observed. Products and conditions to which workers were potentially exposed included six Mine Safety and Health Administration (MSHA) regulated chemicals, one chemical with a NIOSH recommended exposure limit but no MSHA limit, six chemicals that have no NIOSH or MSHA limit, 87 trade name products, four physical agent conditions, 12 musculoskeletal overload conditions, and three welding processes. Estimated annual usage information is provided for chemical substances, both generic and trade name.				
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