1982 Environmental Health Table of Contents

1982 INDUSTRIAL HYGIENE SURVEY SUMMARY

DO 079733
CONFIDENTIAL

1982 INDUSTRIAL HYGIENE SURVEY SUMMARY

It is the responsibility of employers to annually determine employee exposure to potential health hazards in the work area and report the results of all involved personnel. The employee is also to be informed of the toxic and hazardous properties of these chemicals and physical agents, the limits they may be exposed to without danger, the symptoms of overexposure, and what they should do to prevent overexposure.

Environmental Hazards Monitored in CA II Block

	TLV or IHG
Asbestos	2 fib/cc>5μ
Caustic Mist	2 mg/m^3 Ceiling
Chlorine	1 ppm Ceiling
Hydrochloric Acid	7 mg/m^3 Ceiling
Noise	85 db (A)
Sulfuric Acid	1 mg/m^3

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CHLOR-ALKALI II SAMPLING DATA SUMMARY

	# SAMPLES	AVG. READING	HIGHEST READING
1. ASBESTOS			
A. EXCURSION	14	<.54 FIB/CC>5 μ	5.7 FIB/CC>5μ
LIMIT: 10 FIB/CC>5μC			
2. CAUSTIC			
A. PERSONNEL - TWA	3	<.12 MG/M^3	.28 MG/M^3
LIMIT: 2 MG/M^{3}C			
B. EXCURSION	21	<.28 MG/M^3	1.7 MG/M^3
C. AREA	9	3.28 MG/M^3	12.58 MG/M^3
3. CHLORINE			
A. EXCURSION	29	<.51 PPM	7.79 PPM
LIMIT: 1 PPM C			
B. AREA	8	<.21 PPM	.53 PPM

	# SAMPLES	AVG. READING	HIGHEST READING
4. HCL			
A. AREA	3	1.37 MG/M³	2.79 MG/M³
LIMIT: 7 MG/M³C			
5. NOISE	37	28.32%	200%
LIMIT: REPORTED ON 90 DB(A)@100%			
6. SULFURIC ACID			
A. EXCURSION	1	.01 MG/M³	.01 MG/M³
LIMIT: 3 MG/M³			

ASBESTOS

The Dow IHG for asbestos is 2 fibers per cc greater than 5 microns in length. Asbestos fibers in the atmosphere are potentially hazardous. There are no immediate chemical or physical warning properties and effects from overexposure may appear after a latency period of 20 or more years. Asbestosis, mesothelisma and asbestos corns may result from overexposure. A pulp wagon containing wet pulp is used at CA II which eliminates any dry asbestos handling. When the wagon is empty it is brought to Cell Service for refilling. Good housekeeping is the key to keep the area clean of asbestos. Asbestos sampling is done every six months.

Date	Description	Duration (Minutes)	Fibers/cc>5μ	
3/25/82	Pulping Cells - OTT	30	5.70	
4/14/82	Pulping Cells - OTT	45	0.07	
6/4/82	Pulping Cells - SOT	50	0.01	N/D*
6/23/82	Pulping Cells - OTT	64	0.01	N/D*
6/30/82	Pulping Cells - OTT	134	0.02	
7/1/82	Pulping Cells - OTT	149	0.02	
7/8/82	Pulping Cells - OTT	210	0.23	
8/4/82	Pulping Cells - OTT	30	0.20	
9/30/82	Pulping Cells - OTT	89	0.16	
10/4/82	Pulping Cells - OTT	165	0.08	
10/5/82	Pulping Cells - OTT Refilling	56	0.20	
10/6/82	Pulping Cells - OTT Refilling	108	0.70	
10/11/82	Pulping Cells - OTT	74	0.05	
9/29/82	Pulping Cells - OTT	124	0.15	

The one significant reading of 5.70 fibers should be compared to the ceiling short term limit of 10 fibers.

* = Non-Detected

CAUSTIC MIST

There is a ceiling limit set at 2 mg/m^3 for caustic dust and mist. Contact with the skin or eyes causes severe burns and must be washed off immediately. Inhalation causes coughing and painful nose and throat irritation. When working with caustic, rubber boots, rubber gloves, respirator and monogoggles must be worn.

TWA:

Date	Description	Duration (Minutes)	MG/M^3	
8/2/82	Brine OTT - General Rounds	480	.01	
7/27/82	Caustic SOT - General Rounds	480	.28	
8/25/82	Caustic SOT - General Rounds	480	.06	

EXCURSION:

11/2/82	Cell Crew OTT - Catching gpl's	23	.67	
12/21/82	Cell Crew OTT - Catching gpl's	51	.27	
3/25/82	Cell Crew OTT - Catching gpl's	35	.10	
3/31/82	Cell Crew OTT - Catching gpl's	55	.64	
10/5/82	Cell Crew OTT - Catching gpl's	35	.32	
10/5/82	Cell Crew OTT - Catching gpl's	25	1.70	
10/5/82	Brine OT - General Rounds	240	.01	N/D*
10/21/82	Brine OT - General Rounds	240	.24	
10/25/82	Brine OT - General Rounds	240	.03	
8/25/82	Cell SOT - Catching gpl's	45	.01	N/D*
10/5/82	Caustic SOT - General Rounds	246	.01	N/D*
10/21/82	Caustic SOT - General Rounds	240	.01	N/D*
10/22/82	Cells SOT - Catching gpl's	30	.14	
10/26/82	Caustic SOT - General Rounds	255	.01	N/D*
10/29/82	Caustic Sot - General Rounds	240	.05	
12/21/82	Inst. - Caustic Plant	50	.02	
12/21/82	Inst. - Iron Cell Area	87	.93	
12/10/82	Pipefitter - Caustic Area	74	.44	
12/10/82	Millwright - Centrifuge	116	.10	
12/9/82	Pipefitter - Caustic Valve	153	.01	N/D*
12/9/82	Pipefitter - Caustic Valve	153	.08	

* = Non-Detected

AREA:

Date	Description	Duration (Minutes)	MG/M^3
3/26/82	Iron Cells	15	2.20
3/29/82	Iron Cells	15	1.74
4/13/82	Iron Cells N End	15	2.36
4/13/82	Iron Cells N End	15	4.33
11/4/82	SE Corner Centrifuge Deck	15	3.40
11/4/82	S End Iron Cells	15	.79
11/4/82	S End Centrifuge Deck	15	12.58
11/4/82	SE Corner Iron Cells	15	1.47
11/4/82	E End Centrifuge Deck	15	.68

The highest reading obtained in the area sampling was in the presence of a leak on the centrifuge. The iron cell sampling average was 2.14 mg/m^3 and the centrifuge deck sampling average was 5.55 mg/m^3 to be compared with a ceiling limit of 2.0 mg/m^3.

CHLORINE

Chlorine gas is irritating to the eyes, nose, throat and lungs. At high concentrations there can be a burning sensation to the skin. Chlorine has very good warning properties with an odor threshold of approximately 0.25 - 1.0 ppm. The TLV is 1 ppm ceiling. Operators are required to carry a mouth-bit respirator at all times - these are designed to help escape from chlorine. If required to work in a chlorine atmosphere under emergency conditions, Scott Air Pak equipment must be worn. Previous sampling history has shown that TWA sampling for chlorine shows minimum detection so a more concentrated effort is given to excursion job sampling.

EXCURSION:

Date	Description	Duration (Minutes)	PPM	
3/30/82	Cell Crew OTT - Running pH's	105	.1	N/D*
4/15/82	Cell Crew OTT - Running pH's	35	.1	
6/2/82	Cell Crew OTT - Catching NaCl's	50	.2	
6/4/82	Cell Crew OTT - Running pH's	20	.1	N/D*
7/22/82	Cell Crew OTT - Running pH's	35	.1	N/D*
8/2/82	Cell Crew OTT - Running pH's	40	.43	
8/3/82	Cell Crew OTT - Catching NaCl's	40	.1	N/D*
10/5/82	Cell Crew OTT - Running pH's	74	.1	N/D*
4/15/82	Liq. SOT - Block Sample	4	.28	
6/2/82	Liq. SOT - Block Sample	4	.15	
7/27/82	Liq. SOT - Block Sample	5	.1	N/D*
8/2/82	Cell SOT - Round	20	.74	
8/3/82	Cell SOT - Round	40	.1	N/D*
8/9/82	Liq. SOT - Block Samples	15	.82	
8/10/82	Cell SOT - Round	40	.1	
10/6/82	Liq. SOT - Block and Wet Header	20	.1	N/D*
10/6/82	Cell SOT - Round	43	.1	N/D*
10/20/82	Liq. SOT - Block, W. Hdr. & Tail	19	7.79	
10/21/82	Liq. SOT - All samples	15	1.20	
10/21/82	Cell SOT - Rounds	35	.1	N/D*
10/25/82	Liq. SOT - All samples	12	.16	
10/25/82	Cell SOT - Rounds	18	.1	N/D*
10/26/82	Cell SOT - Rounds	25	.1	N/D*
4/15/82	OS - Cell Rounds	60	.97	
12/10/82	Inst. - Cell Analyzer Shack	88	.1	N/D*
12/10/82	Inst. - Cell Analyzer Shack	88	.1	N/D*
12/9/82	Pipefitter - Cell Cathode	72	.1	N/D*
12/9/82	Pipefitter - Cell Cathode	72	.1	N/D*
12/10/82	Pipefitter - Purif. Area	75	.1	N/D*

AREA:

4/13/82	Trench by GT 2	450	.53	
4/14/82	Trench by GT 2	495	.1	N/D*
4/15/82	Trench by GT 2	510	.41	
4/23/82	Trench by GT 2 (sending out WP)	990	.1	N/D*
4/25/82	Outfall	435	.17	
10/27/82	Haz. Waste Area - Startup	173	.1	N/D*
10/27/82	Liq. - Startup	172	.15	
10/27/82	Cell Area - Startup	173	.1	N/D*

* = Non-Detected

The significant high sample was on catching a block chlorine gas sample where operator was in a downwind position. A sniff header has been installed at this sample point to eliminate chlorine exposure, however, on this particular date, the sniff header was plugged. Personnel involved in excursion sampling were wearing respiratory protection. All other samples were in a less than 1 ppm range.

HYDROCHLORIC ACID

HCl has a ceiling TLV of 7 mg/m^3. The concentrated acid or gas can cause severe burns to the skin. Inhalation will irritate the nose, throat, lungs and eyes. Prolonged exposure can result in ulceration of the nose and throat.

Area:

Date	Description	Duration (Minutes)	MG/M^3	
3/30/82	Trench by GT 2	15	.01	N/D*
12/28/82	W End of Iron Cell Deck	40	1.22	
12/28/82	E Side of Iron Cell Deck	40	2.79	

The iron cell samples were collected during the acidizing of the cells and show no problem when compared to the limit of 7 mg/m^3 ceiling.

* = Non-Detected

NOISE

The Louisiana Division Noise Standard states "the permissible exposure to continuous noise shall not exceed an eight hour time-weighted average of 85 db(A), with a doubling rate of 5 db(A) which means that the allowable exposure time doubles with each 5 db(A) reduction in noise level". Prolonged and repeated exposures to levels exceeding 90 db(A) may cause severe damage to the nerves in the inner ear. Caution signs are placed in the high noise level areas in addition to borders being painted on the roadway where hearing protection is required. An area survey of the plant was made using a Bruel and Kjaer Model 2205 Sound Level Meter calibrated at 94 db(A)(1000 Hz). The noise survey showed that all production areas in the block had some noise levels above 85 db(A). The following data is presented in comparision to two standards, the La. Division Standard based on 85 db(A) and the OSHA Standard of 90 db(A). The data indicates that high readings are being obtained on craft personnel. All other data collected falls under 100% .

Date	Description	Duration (Minutes)	La. Div. 85 db(A)	OSHA 90 db(A)
11/2/82	Inst. - General	480	6	3
11/3/82	Inst. - General	480	0	0
11/3/82	Inst. - General	480	6	3
10/27/82	Inst. - Chlorine Comp.	480	316	158
10/28/82	Insulator - Caustic Area	480	400	200
11/1/82	Pipefitter - Oil Storage	480	0	0
11/4/82	Insulator - Caustic Area	480	230	115
11/4/82	Pipefitter - Power Area	480	144	72
11/4/82	Laborer - Caustic & Liq.	480	0	0
4/15/82	Brine OTT - General	480	148	74
5/28/82	Brine OTT - General	480	2	1
6/2/82	Cell Crew OTT - General	480	0	0

Date	Description	Duration (Minutes)	La. Div. 85 db(A)	OSHA 90 db(A)
10/21/82	Cell Crew OTT - General	480	124	62
4/14/82	Brine OT - General	480	18	9
10/22/82	Brine OT - General	480	66	33
10/28/82	OS - Power Area	480	148	74
4/14/82	SOT - Power	480	1	1
4/14/82	SOT - Caustic	480	72	36
4/15/82	SOT - Power	480	6	3
4/15/82	SOT - Caustic	480	40	20
4/15/82	SOT - Liq.	480	26	13
4/16/82	SOT - Cells	480	2	1
5/28/82	SOT - Liq.	480	0	0
5/28/82	SOT - Power	480	0	0
6/2/82	SOT - Cells	480	0	0
6/2/82	SOT - Power	480	0	0
10/21/82	SOT - Liq.	480	50	25
10/21/82	SOT - Power	480	6	3
10/22/82	SOT - Cells	480	2	1
10/22/82	SOT - Caustic	480	98	49
10/25/82	SOT - Liq.	480	72	36
10/25/82	SOT - Power	480	0	0
10/25/82	SOT - Caustic	480	36	18
10/27/82	SOT - Cells	480	40	20
10/27/82	SOT - Caustic	480	2	1
10/28/82	SOT - Caustic	480	0	0
11/1/82	SOT - Power	480	34	17

SULFURIC ACID

The TLV for sulfuric acid is 1 mg/m^3. Exposure to the skin causes severe chemical burns. Inhalation of the mist can produce irritation of the upper respiratory system and nasal passages. When working with sulfuric acid, a full acid suit and respirator must be worn.

EXCURSION:

Date	Description	Duration (Minutes)	MG/M^3	
12/9/82	Millwright changing seals on acid pump	53	.01	N/D*

* = Non-Detected

SAMPLING AND ANALYTICAL METHODS

SAMPLING AND ANALYTICAL METHODS

1. Asbestos: is collected on .8 micron pore size filters and analysis is done by an outside laboratory using the NIOSH approved method #P&CAM 239.

2. Caustic: is collected on .8 micron pore size filters from which the caustic is extracted and analyzed by atomic absorption.

3. Chlorine: is caught in a glass impinger containing a .1% sulfamic solution and then analyzed using a millivolt recorder and chlorine ion electrode.

4. HCl: is collected by scrubbing through a .02N caustic solution in a glass impinger and then analyzed for chlorides using a photoelectric color meter.

5. Noise: is collected on a dosimeter and analyzed by a sound level meter and noise dosimetry.

6. Sulfuric Acid: is scrubbed in an impinger through distilled water and analyzed for sulfates using a spectrophotometer to measure turbidity.

1982 INDUSTRIAL HYGIENE ACCOMPLISHMENTS

1982 INDUSTRIAL HYGIENE ACCOMPLISHMENTS

I. PURIFICATION AND LIQUEFACTION

A. CHLORINE SNIFF HEADERS WERE INSTALLED AT THE BLOCK HEADER IN 1982 AND THE TAIL GAS HEADER WAS COMPLETED IN THE FIRST PART OF THIS YEAR. THESE SNIFF HEADERS ALLOW SAMPLING AT THESE POINTS WITHOUT CHLORINE EXPOSURE.

II. CHLORINE, COOLING DRYING AND COMPRESSION

A. AN ENCLOSED SAMPLE STATION WAS INSTALLED ON THE 17% HCL LINE. THIS ELIMINATED EXPOSURE TO HCL VAPORS AND LIQUID DURING SAMPLING.

III. CAUSTIC AREA

A. THE SEALS ON THE IRON CELL HOODS WERE IMPROVED TO BETTER EVACUATE THE CAUSTIC MIST FROM UNDER THE COVERS. SAMPLING ANALYSIS INDICATED AN AVERAGE OF 1.13 MG/M^3 AFTER THE IMPROVEMENT AS COMPARED TO AN AVERAGE OF 2.66 MG/M^3 BEFORE.

B. A NEW CENTRIFUGE WAS INSTALLED WHICH HAS IMPROVED SEALING DESIGN ON CHUTES AND SHAFT SEALS. SAMPLING ON THE DECK SHOWED AN AVERAGE ANALYSIS OF 5.55 MG/M^3, HOWEVER, THIS SAMPLING WAS DONE IN THE PRESENCE OF LEAKS ON THE CENTRIFUGE. SAMPLING WILL BE DONE AGAIN THIS YEAR.

C. THE SALT COLUMN T-301 WHICH HAS A HISTORY OF CAUSTIC MIST WAS TO BE RESEARCHED FOR METHODS OF IMPROVEMENTS BUT THIS HAS NOT BEEN A MAJOR PROBLEM AND WAS CARRIED OVER TO BE LOOKED AT IN 1983.

D. EXTERNAL PACKING ADJUSTERS WERE INSTALLED ON ALL EVAPORATORS. THEY WERE PREVIOUSLY LOCATED INSIDE THE SKIRTS WHICH MADE THE JOB A VERY HOT AND CONFINING ONE.

E. STEAM TRACING IN THE CAUSTIC AREA WAS CHANGED TO ELECTRICAL TRACING WHICH REDUCED THERMAL EXPOSURE POTENTIAL.

F. THE WEIR ON SALT COLUMN T-302 WAS REPLACED BECAUSE OF CAUSTIC LEAKS POSING EXPOSURE POSSIBILITIES.

G. VACUUM PUMPS WERE INSTALLED TO REPLACE STEAM JETS ON EV303 AND 304 WHICH WERE A SOURCE OF HOT VAPORS. THE JETS HAVE REMAINED AS BACKUP TO THE NEW PUMPS.

H. THE CENTRIFUGE FEED PORTS WERE ENCLOSED TO PREVENT CAUSTIC SPRAYS. WHEN THE CENTRIFUGE TRIPPED IT PRESENTED A SITUATION WHERE CAUSTIC COULD SPRAY FROM AROUND THE FEED PORTS.

IV. <u>POWER AREA</u>

A. DUE TO THE LACK OF FINDING GOOD SOLUTIONS TO RESOLVE THE NOISE SOURCES OR MUFFLE THE NOISE, NO SPECIFIC STEPS WERE TAKEN IN 1982.

V. PLANT-WIDE ACCOMPLISHMENTS

A. THE AREAS OF THE PLANT REQUIRING THAT HEARING PROTECTION BE WORN WERE RE-DESIGNATED BASED ON SOUND LEVEL METER READINGS. THE AREAS NOW REQUIRING PROTECTION ARE BORDERED BY A 4" YELLOW LINE ON ROADWAY LABELLED "HEARING PROTECTION REQUIRED." SIGNS WERE ALSO INSTALLED AS AN ADDITIONAL REMINDER.

B. TWO PLANT-WIDE AUDITS RESULTED IN INDUSTRIAL HYGIENE IMPROVEMENTS.

1. A THERMAL INSULATION AUDIT RESULTED IN MANY "HOT" POINTS BEING INSULATED THROUGHOUT THE PLANT (UNINSULATED HOT PIPING, STEAM TRAPS, ETC).
2. A CHEMICAL LEAK AUDIT RESULTED IN MAINTENANCE BEING DONE THROUGHOUT THE PLANT TO CORRECT LEAK SITUATIONS (SOME MINOR AND SOME MAJOR JOBS).

EMPLOYEE EXPOSURE SUMMARY SHEETS

DO 079752
CONFIDENTIAL

FILLED IN BY Jackie Paul — EMPLOYEE EXPOSURE SUMMARY — QUARTER 1st YEAR 1982

DR# 0027-0713 IHG 2 f/cc > 5μ

PLANT CA II BLOCK 3601 STRESS Asbestos MINIMAL DETECTABLE LIMIT AND UNIT .01 f/cc > 5μ

NO.	JOB CLASS	AREA/ TASK	PERSONNEL *PT EQ.	PERSONNEL TWA BASIS	PERSONNEL NO. SAMPLE	PERSONNEL AVG.	PERSONNEL HIGH	PERSONNEL ** C	EXCURSION EXCUR. DURATION	EXCURSION NO. SAMPLES	EXCURSION AVG.	EXCURSION HIGH	EXCURSION ** C	AREA SAMPLE DURATION	AREA NO. SAMPLES	AREA AVG.	AREA HIGH	AREA ** C
01	OTT	4	1						30	1	5.70	5.70						
02	OT																	
03	SOT																	
04	OS																	
05	SS																	
06	EDO																	
07	LAB																	
09	CLER.																	
10	INSTR																	
11	LABORER																	
13	CONT MAINT																	
16	MATL CONT																	
19	MGRS/NON-OP																	
20	AREA SAMP (NO JC)																	
24	MFG. MGR.																	
26	MFG TECH																	
28	CHEMIST																	
29	S & T SUPV.																	
30	SHIP COORD.																	

*PROTECTIVE EQUIPMENT: (1) MOUTHBIT (2) FULL FACE (3) HALF FACE OR DUST (4) AIR SUPPLY (5) HEARING PROTECTION

**COMMENTS

DO 079753
CONFIDENTIAL

FILLED IN BY Jackie Paul

EMPLOYEE EXPOSURE SUMMARY

DR# 0027-0713

QUARTER 2nd YEAR 1982

IHG 2 fib/cc >5μ

PLANT CA II BLOCK 3601 STRESS Asbestos

MINIMAL DETECTABLE LIMIT AND UNIT .01 fib/cc >5μ

NO.	JOB CLASS	AREA/ TASK	PERSONNEL *PT EQ.	PERSONNEL TWA BASIS	PERSONNEL NO. SAMPLE	PERSONNEL AVG.	PERSONNEL HIGH	PERSONNEL ** C	EXCURSION EXCUR. DURATION	EXCURSION NO. SAMPLES	EXCURSION AVG.	EXCURSION HIGH	EXCURSION ** C	AREA SAMPLE DURATION	AREA NO. SAMPLES	AREA AVG.	AREA HIGH	AREA ** C
01	OTT	4	1						45 min	1	.07	.07						
02	OT																	
03	SOT	4	1			•			50	1	<.01	<.01						
04	OS																	
05	SS																	
06	EDO																	
07	LAB																	
09	CLER.																	
10	INSTR																	
11	LABORER																	
13	CONT MAINT			•														
16	MATL CONT																	
19	MGRS/NON-OP																	
20	AREA SAMP (NO JC)																	
24	MFG. MGR.																	
26	MFG TECH																	
28	CHEMIST																	
29	S & T SUPV.																	
30	SHIP COORD.																	

*PROTECTIVE EQUIPMENT: (1) MOUTHBIT (2) FULL FACE (3) HALF FACE OR DUST (4) AIR SUPPLY (5) HEARING PROTECTION

**COMMENTS

DO 079754
CONFIDENTIAL

FILLED IN BY Jackie Paul — EMPLOYEE EXPOSURE SUMMARY — QUARTER 2nd YEAR 1982

DR# 0027-0713 IHG 2 f/cc < 5 u

PLANT CA II BLOCK 3601 STRESS Asbestos MINIMAL DETECTABLE LIMIT AND UNIT .01 f/cc > 5u

NO.	JOB CLASS	AREA/ TASK	PERSONNEL *PT EQ.	TWA BASIS	NO. SAMPLE	AVG.	HIGH	** C	EXCURSION EXCUR. DURATION	NO. SAMPLES	AVG.	HIGH	** C	AREA SAMPLE DURATION	NO. SAMPLES	AVG.	HIGH	** C
01	OTT	4	1						64 min	1	< .01	< .01						
02	OT																	
03	SOT																	
04	OS																	
05	SS																	
06	EDO																	
07	LAB																	
09	CLER.																	
10	INSTR																	
11	LABORER																	
13	CONT MAINT																	
16	MAIL CONT																	
19	MGRS/NON-OP																	
20	AREA SAMP (NO JC)																	
24	MFG. MGR.																	
26	MFG TECH																	
28	CHEMIST																	
29	S & T SUPV.																	
30	SHIP COORD.																	

*PROTECTIVE EQUIPMENT: (1) MOUTHBIT (2) FULL FACE (3) HALF FACE OR DUST (4) AIR SUPPLY (5) HEARING PROTECTION

**COMMENTS

DO 079755
CONFIDENTIAL

FILLED IN BY Jackie Paul EMPLOYEE EXPOSURE SUMMARY DR# 0027-0713 QUARTER. 2nd YEAR 1982

PLANT CA II BLOCK 3601 STRESS Asbestos MINIMAL DETECTABLE LIMIT AND UNIT .01 fib/cc >5μ IHG 2 fib/cc ≥5μ

NO.	JOB CLASS	AREA/ TASK	PERSONNEL *PT EQ.	PERSONNEL TWA BASIS	PERSONNEL NO. SAMPLE	PERSONNEL AVG.	PERSONNEL HIGH	PERSONNEL ** C	EXCURSION EXCUR. DURATION	EXCURSION NO. SAMPLES	EXCURSION AVG.	EXCURSION HIGH	EXCURSION ** C	AREA SAMPLE DURATION	AREA NO. SAMPLES	AREA AVG.	AREA HIGH	AREA ** C
01	OTT	4							134	1	.02	.02						
02	OT																	
03	SOT																	
04	OS																	
05	SS																	
06	EDO																	
07	LAB																	
09	CLER.																	
10	INSTR																	
11	LABORER																	
13	CONT MAINT																	
16	MATL CONT																	
19	MGRS/NON-OP																	
20	AREA SAMP (NO JC)																	
24	MFG. MGR.																	
26	MFG TECH																	
28	CHEMIST																	
29	S & T SUPV.																	
30	SHIP COORD.																	

*PROTECTIVE EQUIPMENT: (1) MOUTHBIT (2) FULL FACE (3) HALF FACE OR DUST (4) AIR SUPPLY (5) HEARING PROTECTION

**COMMENTS

DO 079756
CONFIDENTIAL

FILLED IN BY Jackie Paul EMPLOYEE EXPOSURE SUMMARY QUARTER 3rd YEAR 1982

DR# 0027-0713 IHG 2 fib/cc > 5 μ

PLANT CA II BLOCK 3601 STRESS Asbesta MINIMAL DETECTABLE LIMIT AND UNIT .01 fib/cc > 5 μ

NO.	JOB CLASS	AREA/ TASK	PERSONNEL *PT EQ.	PERSONNEL TWA BASIS	PERSONNEL NO. SAMPLE	PERSONNEL AVG.	PERSONNEL HIGH	PERSONNEL ** C	EXCURSION EXCUR. DURATION	EXCURSION NO. SAMPLES	EXCURSION AVG.	EXCURSION HIGH	EXCURSION ** C	AREA SAMPLE DURATION	AREA NO. SAMPLES	AREA AVG.	AREA HIGH	AREA ** C
01	OTT	4	1						149	1	.02	.02						
02	OT																	
03	SOT																	
04	OS																	
05	SS																	
06	EDO																	
07	LAB																	
09	CLER.																	
10	INSTR																	
11	LABORER																	
13	CONT MAINT																	
16	MATL CONT																	
19	MGRS/NON-OP																	
20	AREA SAMP (NO JC)																	
24	MFG. MGR.																	
26	MFG TECH																	
28	CHEMIST																	
29	S & T SUPV.																	
30	SHIP COORD.																	

*PROTECTIVE EQUIPMENT: (1) MOUTHBIT (2) FULL FACE (3) HALF FACE OR DUST (4) AIR SUPPLY (5) HEARING PROTECTION

**COMMENTS

DO 079757
CONFIDENTIAL

EMPLOYEE EXPOSURE SUMMARY

FILLED IN BY Jackie Paul DR# 0027-0713 QUARTER 3rd YEAR 1982

PLANT CA II BLOCK 3601 STRESS Asbestos MINIMAL DETECTABLE LIMIT AND UNIT .01 fib/cc >5μ IHG 2 fib/cc >5μ

NO.	JOB CLASS	AREA/ TASK	PERSONNEL *PT EQ.	PERSONNEL TWA BASIS	PERSONNEL NO. SAMPLE	PERSONNEL AVG.	PERSONNEL HIGH	PERSONNEL ** C	EXCURSION EXCUR. DURATION	EXCURSION NO. SAMPLES	EXCURSION AVG.	EXCURSION HIGH	EXCURSION ** C	AREA SAMPLE DURATION	AREA NO. SAMPLES	AREA AVG.	AREA HIGH	AREA ** C
01	OTT	4	1						210	1	.23	.23						
02	OT																	
03	SOT																	
04	OS																	
05	SS																	
06	EDO																	
07	LAB																	
09	CLER.																	
10	INSTR																	
11	LABORER																	
13	CONT MAINT																	
16	MATL CONT																	
19	MGRS/NON-OP																	
20	AREA SAMP (NO JC)																	
24	MFG. MGR.																	
26	MFG TECH																	
28	CHEMIST																	
29	S & T SUPV.																	
30	SHIP COORD.																	

*PROTECTIVE EQUIPMENT: (1) MOUTHBIT (2) FULL FACE (3) HALF FACE OR DUST (4) AIR SUPPLY (5) HEARING PROTECTION

**COMMENTS

DO 079758
CONFIDENTIAL

FILLED IN BY Jackie Paul EMPLOYEE EXPOSURE SUMMARY QUARTER 3rd YEAR 1982

DR# 0027-0713 IHG 2 fib/cc >5μ

PLANT CA II BLOCK 3601 STRESS Asbestos MINIMAL DETECTABLE LIMIT AND UNIT .01 fib/cc >5μ

NO.	JOB CLASS	AREA/ TASK	PERSONNEL *PT EQ.	PERSONNEL TWA BASIS	PERSONNEL NO. SAMPLE	PERSONNEL AVG.	PERSONNEL HIGH	PERSONNEL ** C	EXCURSION EXCUR. DURATION	EXCURSION NO. SAMPLES	EXCURSION AVG.	EXCURSION HIGH	EXCURSION ** C	AREA SAMPLE DURATION	AREA NO. SAMPLES	AREA AVG.	AREA HIGH	AREA ** C
01	OTT	4	1						30	1	.20	.20						
02	OT																	
03	SOT																	
04	OS																	
05	SS																	
06	EDO																	
07	LAB																	
09	CLER.																	
10	INSTR																	
11	LABORER																	
13	CONT MAINT																	
16	MATL CONT																	
19	MGRS/NON-OP																	
20	AREA SAMP (NO JC)																	
24	MFG. MGR.																	
26	MFG TECH																	
28	CHEMIST																	
29	S & T SUPV.																	
30	SHIP COORD.																	

*PROTECTIVE EQUIPMENT: (1) MOUTHBIT (2) FULL FACE (3) HALF FACE OR DUST (4) AIR SUPPLY (5) HEARING PROTECTION

**COMMENTS

DO 079759
CONFIDENTIAL

FILLED IN BY Jackie Paul EMPLOYEE EXPOSURE SUMMARY QUARTER 3rd YEAR 1982

DR# 3027-0713 IHG 2 fib/cc > 5μ

PLANT CA II BLOCK 3601 STRESS Asbestos MINIMAL DETECTABLE LIMIT AND UNIT .01 fib/cc > 5μ

NO.	JOB CLASS	AREA/ TASK	PERSONNEL *PT EQ.	PERSONNEL TWA BASIS	PERSONNEL NO. SAMPLE	PERSONNEL AVG.	PERSONNEL HIGH	PERSONNEL ** C	EXCURSION EXCUR. DURATION	EXCURSION NO. SAMPLES	EXCURSION AVG.	EXCURSION HIGH	EXCURSION ** C	AREA SAMPLE DURATION	AREA NO. SAMPLES	AREA AVG.	AREA HIGH	AREA ** C
01	OTT	4	1						89	1	.16	.16						
02	OT																	
03	SOT																	
04	OS																	
05	SS																	
06	EDO																	
07	LAB																	
09	CLER.																	
10	INSTR																	
11	LABORER																	
13	CONT MAINT																	
16	MATL CONT																	
19	MGRS/NON-OP																	
20	AREA SAMP (NO JC)																	
24	MFG. MGR.																	
26	MFG TECH																	
28	CHEMIST																	
29	S & T SUPV.																	
30	SHIP COORD.																	

*PROTECTIVE EQUIPMENT: (1) MOUTHBIT (2) FULL FACE (3) HALF FACE OR DUST (4) AIR SUPPLY (5) HEARING PROTECTION

**COMMENTS

DO 079760
CONFIDENTIAL

EMPLOYEE EXPOSURE SUMMARY

FILLED IN BY Jackie Paul DR# 0027-0713 QUARTER 3rd YEAR 1982

PLANT CA II BLOCK 3601 STRESS Asbestos MINIMAL DETECTABLE LIMIT AND UNIT .01 fib/cc>5u IHG 2 x 1/2 cc > 5u

NO.	JOB CLASS	AREA/ TASK	PERSONNEL *PT EQ.	TWA BASIS	NO. SAMPLE	AVG.	HIGH	** C	EXCURSION EXCUR. DURATION	NO. SAMPLES	AVG.	HIGH	** C	AREA SAMPLE DURATION	NO. SAMPLES	AVG.	HIGH	** C
01	OTT	4	1						124	1	.15	.15						
02	OT																	
03	SOT																	
04	OS																	
05	SS																	
06	EDO																	
07	LAB																	
09	CLER.																	
10	INSTR																	
11	LABORER																	
13	CONT MAINT																	
16	MATL CONT																	
19	MGRS/NON-OP																	
20	AREA SAMP (NO JC)																	
24	MFG. MGR.																	
26	MFG TECH																	
28	CHEMIST																	
29	S & T SUPV.																	
30	SHIP COORD.																	

*PROTECTIVE EQUIPMENT: (1) MOUTHBIT (2) FULL FACE (3) HALF FACE OR DUST (4) AIR SUPPLY (5) HEARING PROTECTION

**COMMENTS

DO 079761
CONFIDENTIAL

FILLED IN BY Jackie Paul EMPLOYEE EXPOSURE SUMMARY QUARTER 4th YEAR 1982

PLANT CA II BLOCK 3601 STRESS Asbestos DR# 07-0715 MINIMAL DETECTABLE LIMIT AND UNIT .01 fib/cc >5μ IHG 2 fib/cc >5μ

NO.	JOB CLASS	AREA/ TASK	PERSONNEL *PT EQ.	PERSONNEL TWA BASIS	PERSONNEL NO. SAMPLE	PERSONNEL AVG.	PERSONNEL HIGH	PERSONNEL ** C	EXCURSION EXCUR. DURATION	EXCURSION NO. SAMPLES	EXCURSION AVG.	EXCURSION HIGH	EXCURSION ** C	AREA SAMPLE DURATION	AREA NO. SAMPLES	AREA AVG.	AREA HIGH	AREA ** C
01	OTT	4	1						165	1	.08	.08						
02	OT																	
03	SOT																	
04	OS																	
05	SS																	
06	EDO																	
07	LAB																	
09	CLER.																	
10	INSTR																	
11	LABORER																	
13	CONT MAINT																	
16	MATL CONT																	
19	MGRS/NON-OP																	
20	AREA SAMP (NO JC)																	
24	MFG. MGR.																	
26	MFG TECH																	
28	CHEMIST																	
29	S & T SUPV.																	
30	SHIP COORD.																	

*PROTECTIVE EQUIPMENT: (1) MOUTHBIT (2) FULL FACE (3) HALF FACE OR DUST (4) AIR SUPPLY (5) HEARING PROTECTION

**COMMENTS

DO 079762
CONFIDENTIAL

FILLED IN BY Jackie Paul EMPLOYEE EXPOSURE SUMMARY QUARTER 4th YEAR 1982

DR# 0027-0713 IHG 2 f/cc > 5μ

PLANT CA II BLOCK 3601 STRESS Asbestos MINIMAL DETECTABLE LIMIT AND UNIT .01 fib/cc > 5μ

			PERSONNEL						EXCURSION					AREA				
NO.	JOB CLASS	AREA/ TASK	*PT EQ.	TWA BASIS	NO. SAMPLE	AVG.	HIGH	** C	EXCUR. DURATION	NO. SAMPLES	AVG.	HIGH	** C	SAMPLE DURATION	NO. SAMPLES	AVG.	HIGH	** C
01	OTT	4	1						56	1	.20	.20						
02	OT																	
03	SOT																	
04	OS																	
05	SS																	
06	EDO																	
07	LAB																	
09	CLER.																	
10	INSTR																	
11	LABORER																	
13	CONT MAINT																	
16	MATL CONT																	
19	MGRS/NON-OP																	
20	AREA SAMP (NO JC)																	
24	MFG. MGR.																	
26	MFG TECH																	
28	CHEMIST																	
29	S & T SUPV.																	
30	SHIP COORD.																	

*PROTECTIVE EQUIPMENT: (1) MOUTHBIT (2) FULL FACE (3) HALF FACE OR DUST (4) AIR SUPPLY (5) HEARING PROTECTION

**COMMENTS

DO 079763
CONFIDENTIAL

EMPLOYEE EXPOSURE SUMMARY

FILLED IN BY Jackie Paul DR# 0027-0713 QUARTER 4th YEAR 1982

PLANT CA II BLOCK 3601 STRESS Asbestos MINIMAL DETECTABLE LIMIT AND UNIT .01 f/cc >5μ IHG 2 f/cc >5μ

NO.	JOB CLASS	AREA/ TASK	PERSONNEL *PT EQ.	PERSONNEL TWA BASIS	PERSONNEL NO. SAMPLE	PERSONNEL AVG.	PERSONNEL HIGH	PERSONNEL ** C	EXCURSION EXCUR. DURATION	EXCURSION NO. SAMPLES	EXCURSION AVG.	EXCURSION HIGH	EXCURSION ** C	AREA SAMPLE DURATION	AREA NO. SAMPLES	AREA AVG.	AREA HIGH	AREA ** C
01	OTT	4	1						108	1	.70	.70						
02	OT																	
03	SOT																	
04	OS																	
05	SS																	
06	EDO																	
07	LAB																	
09	CLER.																	
10	INSTR																	
11	LABORER																	
13	CONT MAINT																	
16	MATL CONT																	
19	MGRS/NON-OP																	
20	AREA SAMP (NO JC)																	
24	MFG. MGR.																	
26	MFG TECH																	
28	CHEMIST																	
29	S & T SUPV.																	
30	SHIP COORD.																	

*PROTECTIVE EQUIPMENT: (1) MOUTHBIT (2) FULL FACE (3) HALF FACE OR DUST (4) AIR SUPPLY (5) HEARING PROTECTION

**COMMENTS

DO 079764
CONFIDENTIAL

EMPLOYEE EXPOSURE SUMMARY

FILLED IN BY Jackie Paul DR# 0027-0713 QUARTER 4th YEAR 1982

PLANT CA II BLOCK 3601 STRESS Asbestos MINIMAL DETECTABLE LIMIT AND UNIT .01 fib/cc > 5μ IHG 2 fib/cc > 5μ

NO.	JOB CLASS	AREA/ TASK	PERSONNEL *PT EQ.	PERSONNEL TWA BASIS	PERSONNEL NO. SAMPLE	PERSONNEL AVG.	PERSONNEL HIGH	PERSONNEL ** C	EXCURSION EXCUR. DURATION	EXCURSION NO. SAMPLES	EXCURSION AVG.	EXCURSION HIGH	EXCURSION ** C	AREA SAMPLE DURATION	AREA NO. SAMPLES	AREA AVG.	AREA HIGH	AREA ** C
01	OTT	4	1						74	1	.05	.05						
02	OT																	
03	SOT																	
04	OS																	
05	SS																	
06	EDO																	
07	LAB																	
09	CLER.																	
10	INSTR																	
11	LABORER																	
13	CONT MAINT																	
16	MATL CONT																	
19	MGRS/NON-OP																	
20	AREA SAMP (NO JC)																	
24	MFG. MGR.																	
26	MFG TECH																	
28	CHEMIST																	
29	S & T SUPV.																	
30	SHIP COORD.																	

*PROTECTIVE EQUIPMENT: (1) MOUTHBIT (2) FULL FACE (3) HALF FACE OR DUST (4) AIR SUPPLY (5) HEARING PROTECTION

**COMMENTS

DO 079765
CONFIDENTIAL

FILLED IN BY Jackie Reed EMPLOYEE EXPOSURE SUMMARY DR# 0007-9914 QUARTER 1st YEAR 1982

PLANT CA 4 BLOCK 3601 STRESS Caustic MINIMAL DETECTABLE LIMIT AND UNIT .01 mg/m³ IHG .01 mg/m³

NO.	JOB CLASS	AREA/ TASK	PERSONNEL *PT EQ.	PERSONNEL TWA BASIS	PERSONNEL NO. SAMPLE	PERSONNEL AVG.	PERSONNEL HIGH	PERSONNEL ** C	EXCURSION EXCUR. DURATION	EXCURSION NO. SAMPLES	EXCURSION AVG.	EXCURSION HIGH	EXCURSION ** C	AREA SAMPLE DURATION	AREA NO. SAMPLES	AREA AVG.	AREA HIGH	AREA ** C
01	OTT	4	Ø						45	2	.37	.44						
02	OT																	
03	SOT																	
04	OS																	
05	SS																	
06	EDO																	
07	LAB																	
09	CLER.																	
10	INSTR																	
11	LABORER																	
13	CONT MAINT																	
16	MATL CONT																	
19	MGRS/NON-OP																	
20	AREA SAMP (NO JC)													15	2	1.97	2.20	
24	MFG. MGR.																	
26	MFG TECH																	
28	CHEMIST																	
29	S & T SUPV.																	
30	SHIP COORD.																	

*PROTECTIVE EQUIPMENT: (1) MOUTHBIT (2) FULL FACE (3) HALF FACE OR DUST (4) AIR SUPPLY (5) HEARING PROTECTION

**COMMENTS

DO 079766
CONFIDENTIAL

FILLED IN BY Jackie Paul

EMPLOYEE EXPOSURE SUMMARY

DR# 0007-9914

QUARTER 2nd YEAR 1982

IHG .01 mg/m³

PLANT CA-II BLOCK 3601 STRESS Caustic

MINIMAL DETECTABLE LIMIT AND UNIT .01 mg/m³

NO.	JOB CLASS	AREA/ TASK	PERSONNEL *PT EQ.	PERSONNEL TWA BASIS	PERSONNEL NO. SAMPLE	PERSONNEL AVG.	PERSONNEL HIGH	PERSONNEL ** C	EXCURSION EXCUR. DURATION	EXCURSION NO. SAMPLES	EXCURSION AVG.	EXCURSION HIGH	EXCURSION ** C	AREA SAMPLE DURATION	AREA NO. SAMPLES	AREA AVG.	AREA HIGH	AREA ** C
01	OTT																	
02	OT																	
03	SOT																	
04	OS																	
05	SS																	
06	EDO																	
07	LAB																	
09	CLER.																	
10	INSTR																	
11	LABORER																	
13	CONT MAINT																	
16	MATL CONT																	
19	MGRS/NON-OP																	
20	AREA SAMP (NO JC)													15	2	3.35	4.33	
24	MFG. MGR.																	
26	MFG TECH																	
28	CHEMIST																	
29	S & T SUPV.																	
30	SHIP COORD.																	

*PROTECTIVE EQUIPMENT: (1) MOUTHBIT (2) FULL FACE (3) HALF FACE OR DUST (4) AIR SUPPLY (5) HEARING PROTECTION

**COMMENTS

DO 079767
CONFIDENTIAL

EMPLOYEE EXPOSURE SUMMARY

FILLED IN BY Jackie Paul DR# 0007-9914 QUARTER 3rd YEAR 1982

PLANT CAT II BLOCK 3601 STRESS Caustic MINIMAL DETECTABLE LIMIT AND UNIT .01 mg/m³ IHG 2 mg/m³ C

NO.	JOB CLASS	AREA/ TASK	PERSONNEL *PT EQ.	PERSONNEL TWA BASIS	PERSONNEL NO. SAMPLE	PERSONNEL AVG.	PERSONNEL HIGH	PERSONNEL ** C	EXCURSION EXCUR. DURATION	EXCURSION NO. SAMPLES	EXCURSION AVG.	EXCURSION HIGH	EXCURSION ** C	AREA SAMPLE DURATION	AREA NO. SAMPLES	AREA AVG.	AREA HIGH	AREA ** C
01	OTT	3	0	8 hrs	1	<.01	<.01											
02	OT																	
03	SOT	2	0	8 hrs	2	.17	.28											
04	OS																	
05	SS																	
06	EDO																	
07	LAB																	
09	CLER.																	
10	INSTR																	
11	LABORER																	
13	CONT MAINT																	
16	MATL CONT																	
19	MGRS/NON-OP																	
20	AREA SAMP (NO JC)																	
24	MFG. MGR.																	
26	MFG TECH																	
28	CHEMIST																	
29	S & T SUPV.																	
30	SHIP COORD.																	

*PROTECTIVE EQUIPMENT: (1) MOUTHBIT (2) FULL FACE (3) HALF FACE OR DUST (4) AIR SUPPLY (5) HEARING PROTECTION

**COMMENTS

DO 079768
CONFIDENTIAL

FILLED IN BY Jackie Paul EMPLOYEE EXPOSURE SUMMARY QUARTER 2nd YEAR 1982

DR# 0007-9914 IHG 2 mg/m³

PLANT CA II BLOCK 36.01 STRESS Caustic MINIMAL DETECTABLE LIMIT AND UNIT .01 mg/m³

NO.	JOB CLASS	AREA/ TASK	PERSONNEL *PT EQ.	PERSONNEL TWA BASIS	PERSONNEL NO. SAMPLE	PERSONNEL AVG.	PERSONNEL HIGH	PERSONNEL ** C	EXCURSION EXCUR. DURATION	EXCURSION NO. SAMPLES	EXCURSION AVG.	EXCURSION HIGH	EXCURSION ** C	AREA SAMPLE DURATION	AREA NO. SAMPLES	AREA AVG.	AREA HIGH	AREA ** C
01	OTT																	
02	OT																	
03	SOT	4	Ø						45	1	<.01	<.01	5					
04	OS																	
05	SS																	
06	EDO																	
07	LAB																	
09	CLER.																	
10	INSTR																	
11	LABORER																	
13	CONT MAINT																	
16	MATL CONT																	
19	MGRS/NON-OP																	
20	AREA SAMP (NO JC)																	
24	MFG. MGR.																	
26	MFG TECH																	
28	CHEMIST																	
29	S & T SUPV.																	
30	SHIP COORD.																	

*PROTECTIVE EQUIPMENT: (1) MOUTHBIT (2) FULL FACE (3) HALF FACE OR DUST (4) AIR SUPPLY (5) HEARING PROTECTION

**COMMENTS

EMPLOYEE EXPOSURE SUMMARY

FILLED IN BY Jackie Paul DR# 0007-9914 QUARTER 4th YEAR 1992

PLANT CA II BLOCK 3601 STRESS Caustic MINIMAL DETECTABLE LIMIT AND UNIT .01 mg/m² IHG 2 mg/m3 C

			PERSONNEL						EXCURSION					AREA				
NO.	JOB CLASS	AREA/ TASK	*PT EQ.	TWA BASIS	NO. SAMPLE	AVG.	HIGH	** C	EXCUR. DURATION	NO. SAMPLES	AVG.	HIGH	** C	SAMPLE DURATION	NO. SAMPLES	AVG.	HIGH	** C
01	OTT	4	Ø						35	4	.74	1.70	5					
02	OT																	
03	SOT	4	Ø						30	1	.14	.14	5					
04	OS																	
05	SS																	
06	EDO																	
07	LAB																	
09	CLER.																	
10	INSTR	5	Ø						50	1	<.02	<.02						
11	LABORER CONT																	
13	MAINT	5	Ø						116	1	.10	.10						
16	MATL CONT																	
19	MGRS/NON-OP																	
20	AREA SAMP (NO JC)													15	5	3.78	12.58	
24	MFG. MGR.																	
26	MFG TECH																	
28	CHEMIST																	
29	S & T SUPV.																	
30	SHIP COORD.																	

*PROTECTIVE EQUIPMENT: (1) MOUTHBIT (2) FULL FACE (3) HALF FACE OR DUST (4) AIR SUPPLY (5) HEARING PROTECTION

**COMMENTS

DO 079770
CONFIDENTIAL

FILLED IN BY Jackie Paul EMPLOYEE EXPOSURE SUMMARY DR# 0007-9914 QUARTER 4th YEAR 1982

PLANT CA II BLOCK 3601 STRESS Caustic MINIMAL DETECTABLE LIMIT AND UNIT .01 mg/m3 IHG .01 mg/m3

NO.	JOB CLASS	AREA/ TASK	PERSONNEL *PT EQ.	PERSONNEL TWA BASIS	PERSONNEL NO. SAMPLE	PERSONNEL AVG.	PERSONNEL HIGH	PERSONNEL ** C	EXCURSION EXCUR. DURATION	EXCURSION NO. SAMPLES	EXCURSION AVG.	EXCURSION HIGH	EXCURSION ** C	AREA SAMPLE DURATION	AREA NO. SAMPLES	AREA AVG.	AREA HIGH	AREA ** C
01	OTT																	
02	OT																	
03	SOT																	
04	OS																	
05	SS																	
06	EDO																	
07	LAB																	
09	CLER.																	
10	INSTR	5	Ø						87	1	.93	.93						
11	LABORER																	
13	CONT MAINT	5	Ø						153	2	<.045	.08						
16	MATL CONT																	
19	MGRS/NON-OP																	
20	AREA SAMP (NO JC)																	
24	MFG. MGR.																	
26	MFG TECH																	
28	CHEMIST																	
29	S & T SUPV.																	
30	SHIP COORD.																	

*PROTECTIVE EQUIPMENT: (1) MOUTHBIT (2) FULL FACE (3) HALF FACE OR DUST (4) AIR SUPPLY (5) HEARING PROTECTION

**COMMENTS

DO 079771
CONFIDENTIAL

EMPLOYEE EXPOSURE SUMMARY

FILLED IN BY Jackie Paul DR# 0006-7834 QUARTER 1st YEAR 1982

PLANT CA II BLOCK 3601 STRESS Chlorine MINIMAL DETECTABLE LIMIT AND UNIT .1 ppm IHG 1 ppm C

			PERSONNEL						EXCURSION					AREA				
NO.	JOB CLASS	AREA/ TASK	*PT EQ.	TWA BASIS	NO. SAMPLE	AVG.	HIGH	** C	EXCUR. DURATION	NO. SAMPLES	AVG.	HIGH	** C	SAMPLE DURATION	NO. SAMPLES	AVG.	HIGH	** C
01	OTT	4	1						105	1	<.1	<.1	5					
02	OT																	
03	SOT																	
04	OS																	
05	SS																	
06	EDO																	
07	LAB																	
09	CLER.																	
10	INSTR																	
11	LABORER CONT																	
13	MAINT MATL																	
16	CONT MGRS/NON-																	
19	OP AREA SAMP																	
20	(NO JC) MFG.																	
24	MGR. MFG																	
26	TECH																	
28	CHEMIST S & T																	
29	SUPV. SHIP																	
30	COORD.																	

*PROTECTIVE EQUIPMENT: (1) MOUTHBIT (2) FULL FACE (3) HALF FACE OR DUST (4) AIR SUPPLY (5) HEARING PROTECTION

**COMMENTS

DO 079772
CONFIDENTIAL

FILLED IN BY Jackie Paul EMPLOYEE EXPOSURE SUMMARY DR# 0007-9914 QUARTER 4th YEAR 1982

PLANT CAII BLOCK 3601 STRESS Caustic MINIMAL DETECTABLE LIMIT AND UNIT .01 mg/m3 IHG .01 mg/m3

NO.	JOB CLASS	AREA/ TASK	PERSONNEL *PT EQ.	PERSONNEL TWA BASIS	PERSONNEL NO. SAMPLE	PERSONNEL AVG.	PERSONNEL HIGH	PERSONNEL ** C	EXCURSION EXCUR. DURATION	EXCURSION NO. SAMPLES	EXCURSION AVG.	EXCURSION HIGH	EXCURSION ** C	AREA SAMPLE DURATION	AREA NO. SAMPLES	AREA AVG.	AREA HIGH	AREA ** C
01	OTT																	
02	OT	3	Ø						240	3	<.09	.24						
03	SOT	5	Ø						240	4	<.02	.05						
04	OS																	
05	SS																	
06	EDO																	
07	LAB																	
09	CLER.																	
10	INSTR																	
11	LABORER																	
13	CONT MAINT	5	Ø						74	1	.44	.44						
16	MATL CONT																	
19	MGRS/NON-OP																	
20	AREA SAMP (NO JC)																	
24	MFG. MGR.																	
26	MFG TECH																	
28	CHEMIST																	
29	S & T SUPV.																	
30	SHIP COORD.																	

*PROTECTIVE EQUIPMENT: (1) MOUTHBIT (2) FULL FACE (3) HALF FACE OR DUST (4) AIR SUPPLY (5) HEARING PROTECTION

**COMMENTS

DO 079773
CONFIDENTIAL

EMPLOYEE EXPOSURE SUMMARY

FILLED IN BY Jackie Paul DR# 0006-7834 QUARTER 2nd YEAR 1982

PLANT CA II BLOCK 3601 STRESS Chlorine MINIMAL DETECTABLE LIMIT AND UNIT .1 ppm IHG 1 ppm C

NO.	JOB CLASS	AREA/ TASK	*PT EQ.	PERSONNEL TWA BASIS	PERSONNEL NO. SAMPLE	PERSONNEL AVG.	PERSONNEL HIGH	PERSONNEL ** C	EXCURSION EXCUR. DURATION	EXCURSION NO. SAMPLES	EXCURSION AVG.	EXCURSION HIGH	EXCURSION ** C	AREA SAMPLE DURATION	AREA NO. SAMPLES	AREA AVG.	AREA HIGH	AREA ** C
01	OTT	4	1						35	3	<.13	.2	5					
02	OT																	
03	SOT	2	1						4	2	.213	.277	5					
04	OS																	
05	SS																	
06	EDO																	
07	LAB																	
09	CLER.																	
10	INSTR																	
11	LABORER																	
13	CONT MAINT																	
16	MATL CONT																	
19	MGRS/NON-OP																	
20	AREA SAMP (NO JC)	6	Ø											575	5	<.26	.529	
24	MFG. MGR.																	
26	MFG TECH																	
28	CHEMIST																	
29	S & T SUPV.																	
30	SHIP COORD.																	

*PROTECTIVE EQUIPMENT: (1) MOUTHBIT (2) FULL FACE (3) HALF FACE OR DUST (4) AIR SUPPLY (5) HEARING PROTECTION

**COMMENTS

DO 079774
CONFIDENTIAL

EMPLOYEE EXPOSURE SUMMARY

FILLED IN BY Jackie Paul DR# 0006-7834 QUARTER 3rd YEAR 1982

PLANT CA II BLOCK 3601 STRESS Chlorine MINIMAL DETECTABLE LIMIT AND UNIT .1 ppm IHG 1 ppm C

NO.	JOB CLASS	AREA/ TASK	PERSONNEL *PT EQ.	PERSONNEL TWA BASIS	PERSONNEL NO. SAMPLE	PERSONNEL AVG.	PERSONNEL HIGH	PERSONNEL ** C	EXCURSION EXCUR. DURATION	EXCURSION NO. SAMPLES	EXCURSION AVG.	EXCURSION HIGH	EXCURSION ** C	AREA SAMPLE DURATION	AREA NO. SAMPLES	AREA AVG.	AREA HIGH	AREA ** C
01	OTT	4	1						38	3	<.21	.43	5					
02	OT																	
03	SOT	4	1						35	3	<.253	.74						
04	OS																	
05	SS																	
06	EDO																	
07	LAB																	
09	CLER.																	
10	INSTR																	
11	LABORER																	
13	CONT MAINT																	
16	MATL CONT																	
19	MGRS/NON-OP																	
20	AREA SAMP (NO JC)																	
24	MFG. MGR.																	
26	MFG TECH																	
28	CHEMIST																	
29	S & T SUPV.																	
30	SHIP COORD.																	

*PROTECTIVE EQUIPMENT: (1) MOUTHBIT (2) FULL FACE (3) HALF FACE OR DUST (4) AIR SUPPLY (5) HEARING PROTECTION

**COMMENTS

DO 079775
CONFIDENTIAL

FILLED IN BY Jackie Paul

EMPLOYEE EXPOSURE SUMMARY

DR# 0006-7834

QUARTER 3rd YEAR 1982

IHG 1ppm C

PLANT CA II BLOCK 3601 STRESS Chlorine

MINIMAL DETECTABLE LIMIT AND UNIT - 1ppm

NO.	JOB CLASS	AREA/ TASK	PERSONNEL *PT EQ.	PERSONNEL TWA BASIS	PERSONNEL NO. SAMPLE	PERSONNEL AVG.	PERSONNEL HIGH	PERSONNEL ** C	EXCURSION EXCUR. DURATION	EXCURSION NO. SAMPLES	EXCURSION AVG.	EXCURSION HIGH	EXCURSION ** C	AREA SAMPLE DURATION	AREA NO. SAMPLES	AREA AVG.	AREA HIGH	AREA ** C
01	OTT																	
02	OT																	
03	SOT	2	1						15	1	.82	.82	5					
04	OS																	
05	SS																	
06	EDO																	
07	LAB																	
09	CLER.																	
10	INSTR																	
11	LABORER																	
13	CONT MAINT																	
16	MATL CONT																	
19	MGRS/NON-OP																	
20	AREA SAMP (NO JC)																	
24	MFG. MGR.																	
26	MFG TECH																	
28	CHEMIST																	
29	S & T SUPV.																	
30	SHIP COORD.																	

*PROTECTIVE EQUIPMENT: (1) MOUTHBIT (2) FULL FACE (3) HALF FACE OR DUST (4) AIR SUPPLY (5) HEARING PROTECTION

**COMMENTS

DO 079776
CONFIDENTIAL

EMPLOYEE EXPOSURE SUMMARY

FILLED IN BY Jackie Paul DR# 0006-7134 QUARTER 4th YEAR 1982

PLANT CA II BLOCK 301 STRESS Chlorine MINIMAL DETECTABLE LIMIT AND UNIT .1ppm ING 1ppm C

NO.	JOB CLASS	AREA/ TASK	PERSONNEL *PT EQ.	PERSONNEL TWA BASIS	PERSONNEL NO. SAMPLE	PERSONNEL AVG.	PERSONNEL HIGH	PERSONNEL ** C	EXCURSION EXCUR. DURATION	EXCURSION NO. SAMPLES	EXCURSION AVG.	EXCURSION HIGH	EXCURSION ** C	AREA SAMPLE DURATION	AREA NO. SAMPLES	AREA AVG.	AREA HIGH	AREA ** C
01	OTT																	
02	OT																	
03	SOT	4	1						30	4	<.1	<.1						
04	OS	4	1						60	1	.966	.966	5					
05	SS																	
06	EDO																	
07	LAB																	
09	CLER.																	
10	INSTR	4	Ø						88	2	<.1	<.1						
11	LABORER																	
13	CONT MAINT	4	Ø						72	2	<.1	<.1						
16	MATL CONT																	
19	MGRS/NON-OP																	
20	AREA SAMP (NO JC)	2	Ø											172	1	.15	.15	
24	MFG. MGR.																	
26	MFG TECH																	
28	CHEMIST																	
29	S & T SUPV.																	
30	SHIP COORD.																	

*PROTECTIVE EQUIPMENT: (1) MOUTHBIT (2) FULL FACE (3) HALF FACE OR DUST (4) AIR SUPPLY (5) HEARING PROTECTION

**COMMENTS

DO 079777
CONFIDENTIAL

EMPLOYEE EXPOSURE SUMMARY

FILLED IN BY Jackie Paul DR# 0004-3845 QUARTER 1st YEAR 1982

PLANT CAII BLOCK 3601 STRESS HCl MINIMAL DETECTABLE LIMIT AND UNIT .01 mg/m³ IHG 7m mg/m³ C

			PERSONNEL						EXCURSION					AREA				
NO.	JOB CLASS	AREA/ TASK	*PT EQ.	TWA BASIS	NO. SAMPLE	AVG.	HIGH	** C	EXCUR. DURATION	NO. SAMPLES	AVG.	HIGH	** C	SAMPLE DURATION	NO. SAMPLES	AVG.	HIGH	** C
01	OTT																	
02	OT																	
03	SOT																	
04	OS																	
05	SS																	
06	EDO																	
07	LAB																	
09	CLER.																	
10	INSTR																	
11	LABORER																	
13	CONT MAINT																	
16	MATL. CONT																	
19	MGRS/NON-OP																	
20	AREA SAMP (NO JC)													15	1	<.01	<.01	
24	MFG. MGR.																	
26	MFG TECH																	
28	CHEMIST																	
29	S & T SUPV.																	
30	SHIP COORD.																	

*PROTECTIVE EQUIPMENT: (1) MOUTHBIT (2) FULL FACE (3) HALF FACE OR DUST (4) AIR SUPPLY (5) HEARING PROTECTION

**COMMENTS

DO 079778
CONFIDENTIAL

FILLED IN BY Jackie Paul — EMPLOYEE EXPOSURE SUMMARY — DR# 9081-8508 — QUARTER 2nd — YEAR 1982

PLANT CA II — BLOCK 3601 — STRESS Noise — MINIMAL DETECTABLE LIMIT AND UNIT 0 — IHG 85 D61(A)

				PERSONNEL						EXCURSION						AREA				
NO.	JOB CLASS	AREA/ TASK	*PT EQ.	TWA BASIS	NO. SAMPLE	AVG.	HIGH	** C		EXCUR. DURATION	NO. SAMPLES	AVG.	HIGH	** C		SAMPLE DURATION	NO. SAMPLES	AVG.	HIGH	** C
01	OTT		0	8 hr	3	25	74													
02	OT		0	8 hr	1	9	9													
03	SOT	6	5	8 hr	4	1	3													
04	OS																			
05	SS																			
06	EDO																			
07	LAB																			
09	CLER.																			
10	INSTR																			
11	LABORER																			
13	CONT MAINT																			
16	MATL CONT																			
19	MGRS/NON-OP																			
20	AREA SAMP (NO JC)																			
24	MFG. MGR.																			
26	MFG TECH																			
28	CHEMIST																			
29	S & T SUPV.																			
30	SHIP COORD.																			

*PROTECTIVE EQUIPMENT: (1) MOUTHBIT (2) FULL FACE (3) HALF FACE OR DUST (4) AIR SUPPLY (5) HEARING PROTECTION

**COMMENTS

DO 079779
CONFIDENTIAL

FILLED IN BY Jackie Paul EMPLOYEE EXPOSURE SUMMARY DR# 9081-8508 QUARTER 2nd YEAR 1982

PLANT CA II BLOCK 3601 STRESS Noise MINIMAL DETECTABLE LIMIT AND UNIT Ø IHG 85 46(A)

NO.	JOB CLASS	AREA/ TASK	PERSONNEL *PT EQ.	PERSONNEL TWA BASIS	PERSONNEL NO. SAMPLE	PERSONNEL AVG.	PERSONNEL HIGH	PERSONNEL ** C	EXCURSION EXCUR. DURATION	EXCURSION NO. SAMPLES	EXCURSION AVG.	EXCURSION HIGH	EXCURSION ** C	AREA SAMPLE DURATION	AREA NO. SAMPLES	AREA AVG.	AREA HIGH	AREA ** C
01	OTT																	
02	OT																	
03	SOT	2	5	8hr	2	6.5	13											
04	OS																	
05	SS																	
06	EDO																	
07	LAB																	
09	CLER.																	
10	INSTR																	
11	LABORER																	
13	CONT MAINT																	
16	MATL CONT																	
19	MGRS/NON-OP																	
20	AREA SAMP (NO JC)																	
24	MFG. MGR.																	
26	MFG TECH																	
28	CHEMIST																	
29	S & T SUPV.																	
30	SHIP COORD.																	

*PROTECTIVE EQUIPMENT: (1) MOUTHBIT (2) FULL FACE (3) HALF FACE OR DUST (4) AIR SUPPLY (5) HEARING PROTECTION

**COMMENTS

DO 079780
CONFIDENTIAL

EMPLOYEE EXPOSURE SUMMARY

FILLED IN BY Jackie Paul DR# 9081-8508 QUARTER 2nd YEAR 1982

PLANT CA II BLOCK 3001 STRESS Noise MINIMAL DETECTABLE LIMIT AND UNIT 85 dB(A) Ø

			PERSONNEL						EXCURSION					AREA				
NO.	JOB CLASS	AREA/ TASK	*PT EQ.	TWA BASIS	NO. SAMPLE	AVG.	HIGH	** C	EXCUR. DURATION	NO. SAMPLES	AVG.	HIGH	** C	SAMPLE DURATION	NO. SAMPLES	AVG.	HIGH	** C
01	OTT																	
02	OT																	
03	SOT	4	0	8hr	2	.5	1											
04	OS																	
05	SS																	
06	EDO																	
07	LAB																	
09	CLER.																	
10	INSTR																	
11	LABORER																	
13	CONT MAINT																	
16	MAIL CONT																	
19	MGRS/NON-OP																	
20	AREA SAMP (NO JC)																	
24	MFG. MGR.																	
26	MFG TECH																	
28	CHEMIST																	
29	S & T SUPV.																	
30	SHIP COORD.																	

*PROTECTIVE EQUIPMENT: (1) MOUTHBIT (2) FULL FACE (3) HALF FACE OR DUST (4) AIR SUPPLY (5) HEARING PROTECTION

**COMMENTS

DO 079781
CONFIDENTIAL

FILLED IN BY Jackie Paul EMPLOYEE EXPOSURE SUMMARY DR# 9081-8508 QUARTER 2ND YEAR 1982

PLANT CA II BLOCK 3601 STRESS Noise MINIMAL DETECTABLE LIMIT AND UNIT 0 IHG 85 TOTAL

NO.	JOB CLASS	AREA/ TASK	PERSONNEL *PT EQ.	PERSONNEL TWA BASIS	PERSONNEL NO. SAMPLE	PERSONNEL AVG.	PERSONNEL HIGH	PERSONNEL ** C	EXCURSION EXCUR. DURATION	EXCURSION NO. SAMPLES	EXCURSION AVG.	EXCURSION HIGH	EXCURSION ** C	AREA SAMPLE DURATION	AREA NO. SAMPLES	AREA AVG.	AREA HIGH	AREA ** C
01	OTT																	
02	OT																	
03	SOT	5	5	8hr	2	28	36											
04	OS																	
05	SS																	
06	EDO																	
07	LAB																	
09	CLER.																	
10	INSTR																	
11	LABORER																	
13	CONT MAINT																	
16	MATL CONT																	
19	MGRS/NON-OP																	
20	AREA SAMP (NO JC)																	
24	MFG. MGR.																	
26	MFG TECH																	
28	CHEMIST																	
29	S & T SUPV.																	
30	SHIP COORD.																	

*PROTECTIVE EQUIPMENT: (1) MOUTHBIT (2) FULL FACE (3) HALF FACE OR DUST (4) AIR SUPPLY (5) HEARING PROTECTION

**COMMENTS

DO 079782
CONFIDENTIAL

EMPLOYEE EXPOSURE SUMMARY

FILLED IN BY Jackie Paul DR# 9211-8508 QUARTER 4th YEAR 1982

PLANT CA II BLOCK 3601 STRESS Noise MINIMAL DETECTABLE LIMIT AND UNIT 0 IHG 85Sb(A)

NO.	JOB CLASS	AREA/ TASK	PERSONNEL *PT EQ.	TWA BASIS	NO. SAMPLE	AVG.	HIGH	** C	EXCURSION EXCUR. DURATION	NO. SAMPLES	AVG.	HIGH	** C	AREA SAMPLE DURATION	NO. SAMPLES	AVG.	HIGH	** C
01	OTT		0	8hr	1	62	62											
02	OT		0	8hr	1	33	33											
03	SOT	5	5	8hr	4	17	49											
04	OS	6	5	8hr	1	74	74											
05	SS																	
06	EDO																	
07	LAB																	
09	CLER.																	
10	INSTR		5	8 hr.	3	41	152											
11	LABORER																	
13	CONT MAINT		5	8hr	5	77	200											
16	MATL CONT																	
19	MGRS/NON-OP																	
20	AREA SAMP (NO JC)																	
24	MFG. MGR.																	
26	MFG TECH																	
28	CHEMIST																	
29	S & T SUPV.																	
30	SHIP COORD.																	

*PROTECTIVE EQUIPMENT: (1) MOUTHBIT (2) FULL FACE (3) HALF FACE OR DUST (4) AIR SUPPLY (5) HEARING PROTECTION

**COMMENTS

DO 079783
CONFIDENTIAL

FILLED IN BY Jackie Paul EMPLOYEE EXPOSURE SUMMARY DR# 9081-8508 QUARTER 4th YEAR 1982

PLANT CA II BLOCK 3601 STRESS Noise MINIMAL DETECTABLE LIMIT AND UNIT 0 IHG 85-86(A)

			PERSONNEL						EXCURSION					AREA				
NO.	JOB CLASS	AREA/ TASK	*PT EQ.	TWA BASIS	NO. SAMPLE	AVG.	HIGH	** C	EXCUR. DURATION	NO. SAMPLES	AVG.	HIGH	** C	SAMPLE DURATION	NO. SAMPLES	AVG.	HIGH	** C
01	OTT																	
02	OT																	
03	SOT	2	5	8hr	2	30.5	36											
04	OS																	
05	SS																	
06	EDO																	
07	LAB																	
09	CLER.																	
10	INSTR																	
11	LABORER CONT																	
13	MAINT MATL																	
16	CONT MGRS/NON-																	
19	OP AREA SAMP																	
20	(NO JC) MFG.																	
24	MGR. MFG																	
26	TECH																	
28	CHEMIST S & T																	
29	SUPV. SHIP																	
30	COORD.																	

*PROTECTIVE EQUIPMENT: (1) MOUTHBIT (2) FULL FACE (3) HALF FACE OR DUST (4) AIR SUPPLY (5) HEARING PROTECTION

**COMMENTS

DO 079784
CONFIDENTIAL

FILLED IN BY Jackie Paul EMPLOYEE EXPOSURE SUMMARY DR# 9081-8508 QUARTER 4th YEAR 1982

PLANT CA II BLOCK 3601 STRESS Noise MINIMAL DETECTABLE LIMIT AND UNIT Ø IHG 85 dB(A)

NO.	JOB CLASS	AREA/ TASK	PERSONNEL *PT EQ.	PERSONNEL TWA BASIS	PERSONNEL NO. SAMPLE	PERSONNEL AVG.	PERSONNEL HIGH	PERSONNEL ** C	EXCURSION EXCUR. DURATION	EXCURSION NO. SAMPLES	EXCURSION AVG.	EXCURSION HIGH	EXCURSION ** C	AREA SAMPLE DURATION	AREA NO. SAMPLES	AREA AVG.	AREA HIGH	AREA ** C
01	OTT																	
02	OT																	
03	SOT	4	0	8hr	2	10.5	20											
04	OS																	
05	SS																	
06	EDO																	
07	LAB																	
09	CLER.																	
10	INSTR																	
11	LABORER																	
13	CONT MAINT																	
16	MATL CONT																	
19	MGRS/NON-OP																	
20	AREA SAMP (NO JC)																	
24	MFG. MGR.																	
26	MFG TECH																	
28	CHEMIST																	
29	S & T SUPV.																	
30	SHIP COORD.																	

*PROTECTIVE EQUIPMENT: (1) MOUTHBIT (2) FULL FACE (3) HALF FACE OR DUST (4) AIR SUPPLY (5) HEARING PROTECTION

**COMMENTS

DO 079785
CONFIDENTIAL

FILLED IN BY Jackie Paul EMPLOYEE EXPOSURE SUMMARY DR# 9081-8508 QUARTER 4th YEAR 1982

PLANT CA 4 BLOCK 601 STRESS Noise MINIMAL DETECTABLE LIMIT AND UNIT 8 IHG 85 dB(A)

NO.	JOB CLASS	AREA/ TASK	PERSONNEL *PT EQ.	TWA BASIS	NO. SAMPLE	AVG.	HIGH	** C	EXCURSION EXCUR. DURATION	NO. SAMPLES	AVG.	HIGH	** C	AREA SAMPLE DURATION	NO. SAMPLES	AVG.	HIGH	** C
01	OTT																	
02	OT																	
03	SOT	6	5	8hr	3	66	17											
04	OS																	
05	SS																	
06	EDO																	
07	LAB																	
09	CLER.																	
10	INSTR																	
11	LABORER																	
13	CONT MAINT																	
16	MATL CONT																	
19	MGRS/NON-OP																	
20	AREA SAMP (NO JC)																	
24	MFG. MGR.																	
26	MFG TECH																	
28	CHEMIST																	
29	S & T SUPV.																	
30	SHIP COORD.																	

*PROTECTIVE EQUIPMENT: (1) MOUTHBIT (2) FULL FACE (3) HALF FACE OR DUST (4) AIR SUPPLY (5) HEARING PROTECTION

**COMMENTS

DO 079786
CONFIDENTIAL

FILLED IN BY Jackie Paul EMPLOYEE EXPOSURE SUMMARY DR# 0009-3583 QUARTER 4th YEAR 1982

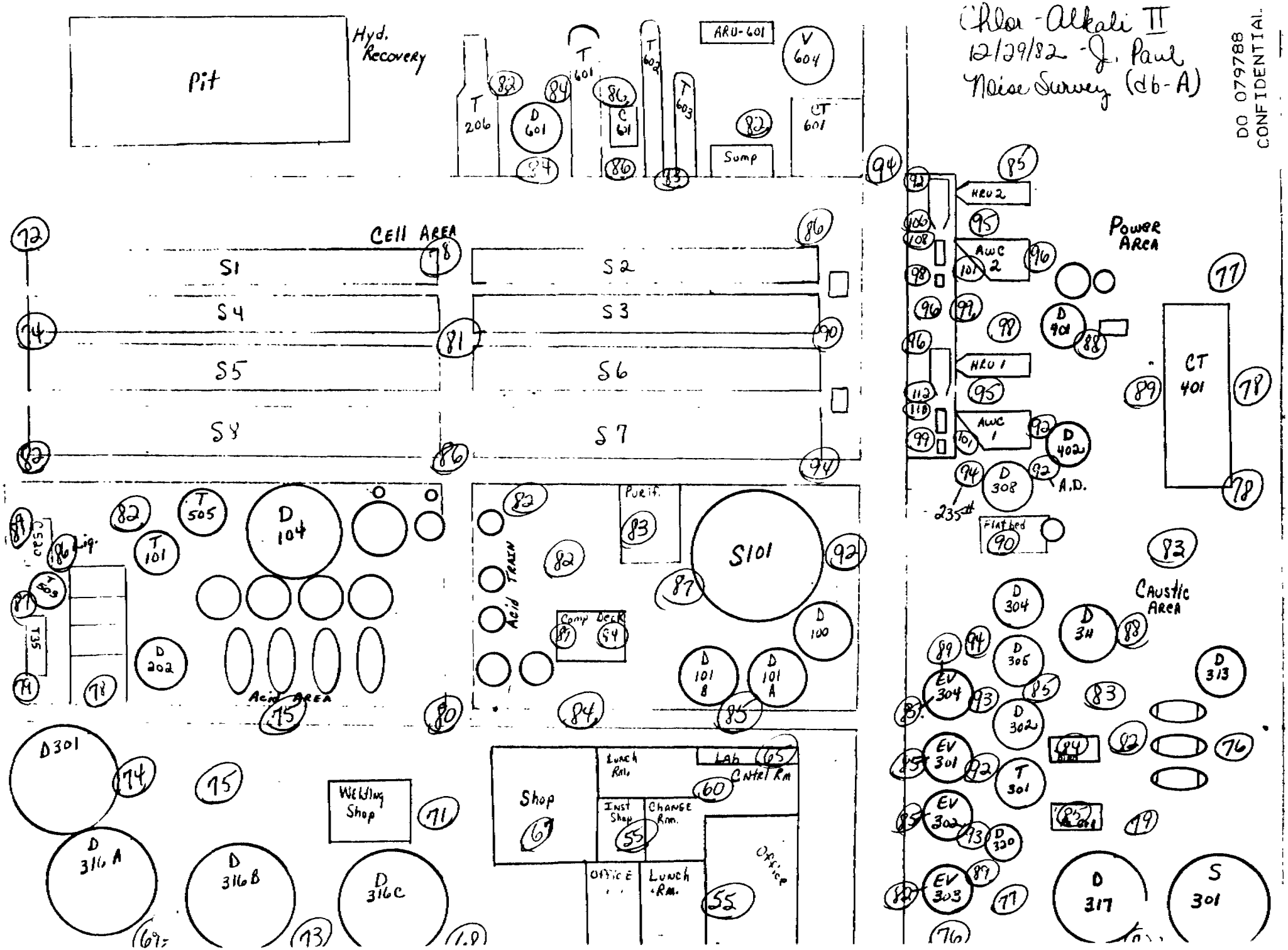
PLANT CA II BLOCK 3601 STRESS H2SO4 MINIMAL DETECTABLE LIMIT AND UNIT .01 mg/m3 IHG 1mg/m3

			PERSONNEL						EXCURSION					AREA				
NO.	JOB CLASS	AREA/ TASK	*PT EQ.	TWA BASIS	NO. SAMPLE	AVG.	HIGH	** C	EXCUR. DURATION	NO. SAMPLES	AVG.	HIGH	** C	SAMPLE DURATION	NO. SAMPLES	AVG.	HIGH	** C
01	OTT																	
02	OT																	
03	SOT																	
04	OS																	
05	SS																	
06	EDO																	
07	LAB																	
09	CLER.																	
10	INSTR																	
11	LABORER																	
13	CONT MAINT			•					53	1	<.01	<.01						
16	MATL CONT					•												
19	MGRS/NON-OP																	
20	AREA SAMP (NO JC)																	
24	MFG. MGR.																	
26	MFG TECH																	
28	CHEMIST																	
29	S & T SUPV.																	
30	SHIP COORD.																	

*PROTECTIVE EQUIPMENT: (1) MOUTHBIT (2) FULL FACE (3) HALF FACE OR DUST (4) AIR SUPPLY (5) HEARING PROTECTION

**COMMENTS

PLANT NOISE SURVEY MAP


Chlor-Alkali II
12/29/82 - J. Paul
Noise Survey (db-A)
DO 079788
CONFIDENTIAL
Pit
Hyd. Recovery
ARU-601
V 604
T 601
T 602
T 603
T 206
D 601
C 601
CT 601
Sump
Cell Area
S1
S2
S3
S4
S5
S6
S7
S8
HRU 2
HRU 1
AWC 2
AWC 1
Power Area
D 401
CT 401
D 402
D 308
A.D.
235#
Flatbed
T 505
D 104
T 101
CCSC
Liq.
T35
D 202
Acid Area
Purif.
Acid Train
Comp Deck
S101
D 100
D 101 B
D 101 A
D 304
D 311
Caustic Area
D 306
D 313
EV 304
D 302
EV 301
T 301
EV 302
D 320
EV 303
D 317
S 301
D 301
D 316 A
D 316 B
D 316 C
Welding Shop
Shop
Lunch Rm.
Lab
Cntrl Rm
Inst Shop
Change Rm.
Office
Lunch Rm.
Office

CHEMICAL & PHYSICAL INVENTORY SHEETS

Figure 1. CURRENT DEFINITION FOR DEGREES OF EXPOSURE

The four ratings for the degrees of exposure are the same as defined on the back of the Industrial Hygiene Data Sheet of Properties, Health Hazards and Precautions for Safe Handling of Materials.

DEGREES OF EXPOSURE RELATED TO TYPES OF OPERATION		
NO CONTACT	I	Characterized by remote operation with equipment isolated from the work area. The persons entering isolated areas will require the personal protection outlined in IV below.
MINOR CONTACT	II	Characterized by closed systems with equipment vented outside the work area, instrument control, mechanical handling of materials in bulk. Examples are: continuous reactors, stills, and filters, enclosed conveyors, ventilated packaging.
OCCASIONAL DAILY CONTACT	III	Characterized by manual handling of materials in packages such as bags, drums and fiberpaks. Ventilation may be provided for specific jobs. Many batch operations falls into this category.
GROSS CONTACT LIKELY	IV	Characterized by hand operation. Examples are: emergency repairs, cleaning equipment, cleaning filters, taking care of spills, packaging volatile or dusty materials without ventilation, wheeling and tray drying.

The degrees of exposure, as rated by plant supervision and reviewed by the industrial hygienist, were based on normal operating conditions. Each was based on regular observations of the operating procedures and work practices employed by operators in the specific job classification.

Figure 2. CURRENT DEFINITIONS OF HAZARD RATINGS

A hazard rating is defined as follows.

A numerical rating ranging from 1 (high) through 5 (low) which estimates the probability that an injury or excessive exposure will occur in a given situation or environment. It is based on the degree of exposure and the physical and toxic properties of the chemical. The degree of exposure is influenced by the type of process (open versus closed system) and the type of operation required (manual versus automatic).

Hazard is the likelihood that injury will occur in a given situation. The hazard rating will be unique for the job classification in a particular plant. Within a given plant the hazard rating for a single chemical may be different for various job classifications because of the varying degree of exposure.

The guidelines the U.S. Area Industrial Hygiene Laboratory is using in setting hazard ratings are as follows.

Hazard Rating 1 -- This rating is designated for materials that are highly toxic and/or have physical properties that can lead to exposure of toxic quantities. There is a significant possibility of a serious, excessive exposure under the conditions of use. These materials require immediate action from plant supervision and industrial hygiene to evaluate and control exposure levels. Periodic follow up documentation is needed for each control measure attempted. Continuous area monitoring should probably be used in these processes and every effort made to reduce the hazard.

Hazard Rating 2 -- This designation indicates that the material has a relatively high toxicity and/or the necessary physical properties are such that the likelihood of excessive exposure to toxic quantities is high but the consequences of exposure to toxic amounts are less severe than for materials with a hazard rating of 1. These materials require periodic monitoring (at least annually to evaluate the exposure). Continuous area monitoring should be considered.

Hazard Rating 3 -- This designation is for materials which are moderately toxic and the likelihood of injury from exposure to toxic amounts is moderate. The employee's exposure to these materials requires industrial hygiene monitoring where feasible, but the frequency may be reduced. Where monitoring is not planned, a written explanation of the basis of judgment of acceptable exposure is needed.

Hazard Rating 4 -- Under the conditions of use, employees may be exposed to moderately toxic materials but the likelihood of an exposure to toxic amounts with serious adverse effects is low. Monitoring is not normally required, but employees' exposures should be documented when practical.

Hazard Rating 5 -- This designation is used for materials that have low toxicity and/or the potential for exposure to toxic amounts is low. Under the conditions f use it is almost certain that the material does not pose a helth hazard. Although monitoring is not required, employee exposure data should be obtained if practical. Normally a hazard rating of 5 does not require informing the employee of the consequences of exposure to toxic amounts of the chemical or hysical agent. This designation should be assigned judiciously. The employee should be prepared to protect himself from exposure during abnormal operating conditions.

CHEMICAL AND PHYSICAL AGENT INVENTORY

SUPERINTENDENT NAME	PLANT	BUILDING NO.
WARREN CLARK	CHLOR-ALKALI II	3601

FILLED OUT BY	DATE
JACKIE PAUL	12/10/82

JOB CLASSIFICATION	INDEX NUMBER	NO. OF EMPLOYEES IN CLASSIFICATION
Cell Crew		3

MATERIALS OR PHYSICAL AGENTS	INDUSTRIAL HYGIENE GUIDE ppm or mg/m³	* DEGREE OF EXPOSURE	** HAZARD RATING	DATA SHEET AVAILABLE
RAW MAT'L:				
Brine	10 mg/m³	3	4	Yes
PRODUCTS:				
Chlorine	1 ppm C	3	2	Yes
Caustic	2 mg/m³ C	3	3	Yes
Hydrogen	1000 ppm	2	4	Yes
BY-PRODUCTS:				
Chlorinated-Organics (Various)		2	4	Yes
Hypochlorites	N/E	2	4	Yes
ADDITIVES:				
Betz Chemicals (2020,2080,Sulphite 3, Balanced Polymer 6000)	N/E	1	4	Yes
CO_2	5000 ppm	1	4	Yes
HCl	7 mg/m³ C	3	4	Yes
H_2SO_4	1 mg/m³	1	4	Yes
Hydrogen Peroxide	1 ppm	1	4	Yes
Mg Chloride	N/E	2	4	Yes
Nalco Floc	N/E	1	4	Yes
Sodium Thiosulfate	10 mg/m³	1	4	Yes
PHYSICAL AGENTS:				
Heat		2	4	Yes
Noise	85 db(A)	2	3	Yes
UTILITIES:				
Condensate		1	5	No
Methane	Simple Asphy.	1	4	Yes
Nitrogen	1000 ppm	1	4	Yes

DO 079792
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* See Industrial Hygiene Data Sheet.

** To be filled in by Industrial Hygiene.

FORM M-47710 PRINTED 8-10-74

CHEMICAL AND PHYSICAL AGENT INVENTORY

SUPERINTENDENT NAME	PLANT	BUILDING NO.
WARREN CLARK	CHLOR-ALKALI II	3601

FILLED OUT BY	DATE
JACKIE PAUL	12/10/82

JOB CLASSIFICATION	INDEX NUMBER	NO. OF EMPLOYEES IN CLASSIFICATION
Liquefaction Operators		4

MATERIALS OR PHYSICAL AGENTS	INDUSTRIAL HYGIENE GUIDE ppm or mg/m³	* DEGREE OF EXPOSURE	** HAZARD RATING	DATA SHEET AVAILABLE
RAW MAT'L:				
Brine	10 mg/m³	2	4	Yes
PRODUCTS:				
Chlorine	1 ppm C	2	2	Yes
Caustic	2 mg/m³ C	2	4	Yes
Hydrogen	1000 ppm	1	4	Yes
BY-PRODUCTS:				
Chlorinated-Organics (Various)		3	3	Yes
Hypochlorites	N/E	1	4	Yes
ADDITIVES:				
Betz Chemicals (2020,2080,Sulphite 3, Balanced Polymer 6000)	N/E	1	4	Yes
CO_2	5000 ppm	1	4	Yes
HCl	7 mg/m³ C	2	4	Yes
H_2SO_4	1 mg/m³	2	4	Yes
Hydrogen Peroxide	1 ppm	1	4	Yes
Mg Chloride	N/E	1	4	Yes
Nalco Floc	N/E	1	4	Yes
Sodium Thiosulfate	10 mg/m³	1	4	Yes
PHYSICAL AGENTS:				
Heat		2	4	Yes
Noise	85 db(A)	3	2	Yes
UTILITIES:				
Condensate		1	5	No
Methane	Simple Asphy.	1	4	Yes
Nitrogen	1000 ppm	1	4	Yes

DO 079793
CONFIDENTIAL

* See Industrial Hygiene Data Sheet.

** To be filled in by Industrial Hygiene.

FORM M-47710 PRINTED 8-10-74

CHEMICAL AND PHYSICAL AGENT INVENTORY

SUPERINTENDENT NAME	PLANT	BUILDING NO.
WARREN CLARK	CHLOR-ALKALI II	3601

FILLED OUT BY	DATE
JACKIE PAUL	12/10/82

JOB CLASSIFICATION	INDEX NUMBER	NO. OF EMPLOYEES IN CLASSIFICATION
Caustic Operators		8

MATERIALS OR PHYSICAL AGENTS	INDUSTRIAL HYGIENE GUIDE ppm or mg/m^3	* DEGREE OF EXPOSURE	** HAZARD RATING	DATA SHEET AVAILABLE
RAW MAT'L:				
Brine	10 mg/m^3	2	4	Yes
PRODUCTS:				
Chlorine	1 ppm C	2	4	Yes
Caustic	2 mg/m^3 C	4	2	Yes
Hydrogen	1000 ppm	1	4	Yes
BY-PRODUCTS:				
Chlorinated-Organics (Various)		1	4	Yes
Hypochlorites	N/E	1	4	Yes
ADDITIVES:				
Betz Chemicals (2020,2080,Sulphite 3, Balanced Polymer 6000)	N/E	1	4	Yes
CO_2	5000 ppm	1	4	Yes
HCl	7 mg/m^3 C	2	4	Yes
H_2SO_4	1 mg/m^3	1	4	Yes
Hydrogen Peroxide	1 ppm	2	4	Yes
Mg Chloride	N/E	1	4	Yes
Nalco Floc	N/E	1	4	Yes
Sodium Thiosulfate	10 mg/m^3	1	4	Yes
PHYSICAL AGENTS:				
Heat		2	4	Yes
Noise	85 db(A)	4	2	Yes
UTILITIES:				
Condensate		1	5	No
Methane	Simple Asphy.	1	4	Yes
Nitrogen	1000 ppm	1	4	Yes

DO 079794
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* See Industrial Hygiene Data Sheet.

** To be filled in by Industrial Hygiene.

FORM M-47710 PRINTED R-10-74

CHEMICAL AND PHYSICAL AGENT INVENTORY

SUPERINTENDENT NAME	PLANT	BUILDING NO.
WARREN CLARK	CHLOR-ALKALI II	3601

FILLED OUT BY	DATE
JACKIE PAUL	12/10/82

JOB CLASSIFICATION	INDEX NUMBER	NO. OF EMPLOYEES IN CLASSIFICATION
Power Operators		4

MATERIALS OR PHYSICAL AGENTS	INDUSTRIAL HYGIENE GUIDE ppm or mg/m^3	* DEGREE OF EXPOSURE	** HAZARD RATING	DATA SHEET AVAILABLE
RAW MAT'L:				
Brine	10 mg/m^3	1	4	Yes
PRODUCTS:				
Chlorine	1 ppm C	2	4	Yes
Caustic	2 mg/m^3 C	1	4	Yes
Hydrogen	1000 ppm	1	4	Yes
BY-PRODUCTS:				
Chlorinated-Organics (Various)		1	4	Yes
Hypochlorites	N/E	1	4	Yes
ADDITIVES:				
Betz Chemicals (2020,2080,Sulphite 3, Balanced Polymer 6000)	N/E	2	4	Yes
CO_2	5000 ppm	1	4	Yes
HCl	7 mg/m^3 C	1	4	Yes
H_2SO_4	1 mg/m^3	2	4	Yes
Hydrogen Peroxide	1 ppm	1	4	Yes
Mg Chloride	N/E	1	4	Yes
Nalco Floc	N/E	1	4	Yes
Sodium Thiosulfate	10 mg/m^3	1	4	Yes
PHYSICAL AGENTS:				
Heat		2	4	Yes
Noise	85 db(A)	4	2	Yes
UTILITIES:				
Condensate		1	5	No
Methane	Simple Asphy.	2	4	Yes
Nitrogen	1000 ppm	1	4	Yes

DO 079795
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* See Industrial Hygiene Data Sheet.

** To be filled in by Industrial Hygiene.

FORM M-47710 PRINTED R-10-74

CHEMICAL AND PHYSICAL AGENT INVENTORY

SUPERINTENDENT NAME	DEPT	DEPT NO
WARREN CLARK	CHLOR-ALKALI II	3601

FILLED OUT BY	DATE
JACKIE PAUL	12/10/82

JOB CLASSIFICATION	INDEX NUMBER	NO OF EMPLOYEES IN CLASSIFICATION
Cell Operators		4

MATERIALS OR PHYSICAL AGENTS	INDUSTRIAL HYGIENE GUIDE ppm or mg/m³	* DEGREE OF EXPOSURE	** HAZARD RATING	DATA SHEET AVAILABLE
RAW MAT'L:				
Brine	10 mg/m³	5	4	Yes
PRODUCTS:				
Chlorine	1 ppm C	5	2	Yes
Caustic	2 mg/m³ C	3	3	Yes
Hydrogen	1000 ppm	2	4	Yes
BY-PRODUCTS:				
Chlorinated-Organics (Various)		2	3	Yes
Hypochlorites	N/E	2	4	Yes
ADDITIVES:				
Betz Chemicals (2020,2080,Sulphite 3, Balanced Polymer 6000)	N/E	1	2	Yes
CO_2	5000 ppm	1	2	Yes
HCl	7 mg/m³ C	3	4	Yes
H_2SO_4	1 mg/m³	1	4	Yes
Hydrogen Peroxide	1 ppm	1	4	Yes
Mg Chloride	N/E	2	2	Yes
Nalco Floc	N/E	1	2	Yes
Sodium Thiosulfate	10 mg/m³	1	-	Yes
PHYSICAL AGENTS:				
Heat		2	4	Yes
Noise	85 db(A)	2	3	Yes
UTILITIES:				
Condensate		1	5	No
Methane	Simple Asphy.	1	4	Yes
Nitrogen	1000 ppm	1	4	Yes

DO 079796
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* See Industrial Hygiene Data Sheet.

** To be filled in by Industrial Hygiene.

FORM M-4771C PRINTED R-10-74

CHEMICAL AND PHYSICAL AGENT INVENTORY

SUPERINTENDENT NAME	PLANT	BUILDING NO.
WARREN CLARK	CHLOR-ALKALI II	3601

FILLED OUT BY	DATE
JACKIE PAUL	12/10/82

JOB CLASSIFICATION	INDEX NUMBER	NO. OF EMPLOYEES IN CLASSIFICATION
Brine Operators		4

MATERIALS OR PHYSICAL AGENTS	INDUSTRIAL HYGIENE GUIDE ppm or mg/m^3	* DEGREE OF EXPOSURE	** HAZARD RATING	DATA SHEET AVAILABLE
RAW MAT'L:				
Brine	10 mg/m^3	3	4	Yes
PRODUCTS:				
Chlorine	1 ppm C	2	3	Yes
Caustic	2 mg/m^3 C	2	3	Yes
Hydrogen	1000 ppm	1	4	Yes
BY-PRODUCTS:				
Chlorinated-Organics (Various)		2	4	Yes
Hypochlorites	N/E	2	4	Yes
ADDITIVES:				
Betz Chemicals (2020,2080,Sulphite 3, Balanced Polymer 6000)	N/E	1	4	Yes
CO_2	5000 ppm	1	4	Yes
HCl	7 mg/m^3 C	2	4	Yes
H_2SO_4	1 mg/m^3	1	4	Yes
Hydrogen Peroxide	1 ppm	1	4	Yes
Mg Chloride	N/E	1	4	Yes
Nalco Floc	N/E	2	4	Yes
Sodium Thiosulfate	10 mg/m^3	2	4	Yes
PHYSICAL AGENTS:				
Heat		1	4	Yes
Noise	85 db(A)	2	3	Yes
UTILITIES:				
Condensate		1	5	No
Methane	Simple Asphy.	1	4	Yes
Nitrogen	1000 ppm	1	4	Yes

DO 079797
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* See Industrial Hygiene Data Sheet.

** To be filled in by Industrial Hygiene.

FORM M-47710 PRINTED 8-10-74

CHEMICAL AND PHYSICAL AGENT INVENTORY

SUPERINTENDENT NAME	PLANT	BUILDING NO.
WARREN CLARK	CHLOR-ALKALI II	3601

FILLED OUT BY	DATE
JACKIE PAUL	12/10/82

JOB CLASSIFICATION	INDEX NUMBER	NO. OF EMPLOYEES IN CLASSIFICATION
Operations Specialist (works all areas - exposure applicable to area working)		11

MATERIALS OR PHYSICAL AGENTS	INDUSTRIAL HYGIENE GUIDE ppm or mg/m^3	* DEGREE OF EXPOSURE	** HAZARD RATING	DATA SHEET AVAILABLE
RAW MAT'L:				
Brine	10 mg/m^3			Yes
PRODUCTS:				
Chlorine	1 ppm C			Yes
Caustic	2 mg/m^3 C			Yes
Hydrogen	1000 ppm			Yes
BY-PRODUCTS:				
Chlorinated-Organics (Various)				Yes
Hypochlorites	N/E			Yes
ADDITIVES:				
Betz Chemicals (2020,2080,Sulphite 3, Balanced Polymer 6000)	N/E			Yes
CO_2	5000 ppm			Yes
HCl	7 mg/m^3 C			Yes
H_2SO_4	1 mg/m^3			Yes
Hydrogen Peroxide	1 ppm			Yes
Mg Chloride	N/E			Yes
Nalco Floc	N/E			Yes
Sodium Thiosulfate	10 mg/m^3			Yes
PHYSICAL AGENTS:				
Heat				Yes
Noise	85 db(A)			Yes
UTILITIES:				
Condensate				No
Methane	Simple Asphy			Yes
Nitrogen	1000 ppm			Yes

DO 079798
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* See Industrial Hygiene Data Sheet.

** To be filled in by Industrial Hygiene.

FORM M-4771C PRINTED 8-10-74

CHEMICAL AND PHYSICAL AGENT INVENTORY

SUPERINTENDENT NAME	PLANT	BUILDING NO.
WARREN CLARK	CHLOR-ALKALI II	3601

FILLED OUT BY	DATE
JACKIE PAUL	12/10/82

JOB CLASSIFICATION	INDEX NUMBER	NO. OF EMPLOYEES IN CLASSIFICATION
Shift Supervisor		4

MATERIALS OR PHYSICAL AGENTS	INDUSTRIAL HYGIENE GUIDE ppm or mg/m^3	* DEGREE OF EXPOSURE	** HAZARD RATING	DATA SHEET AVAILABLE
RAW MAT'L:				
Brine	10 mg/m^3	2	4	Yes
PRODUCTS:				
Chlorine	1 ppm C	2	3	Yes
Caustic	2 mg/m^3 C	2	4	Yes
Hydrogen	1000 ppm	2	4	Yes
BY-PRODUCTS:				
Chlorinated-Organics (Various)		2	4	Yes
Hypochlorites	N/E	1	4	Yes
ADDITIVES:				
Betz Chemicals (2020,2080,Sulphite 3, Balanced Polymer 6000)	N/E	1	4	Yes
CO_2	5000 ppm	1	4	Yes
HCl	7 mg/m^3C	2	4	Yes
H_2SO_4	1 mg/m^3	2	4	Yes
Hydrogen Peroxide	1 ppm	2	4	Yes
Mg Chloride	N/E	1	4	Yes
Nalco Floc	N/E	1	4	Yes
Sodium Thiosulfate	10 mg/m^3	1	4	Yes
PHYSICAL AGENTS:				
Heat		1	4	Yes
Noise	85 db(A)	2	4	Yes
UTILITIES:				
Condensate		1	5	No
Methane	Simple Asphy.	1	4	Yes
Nitrogen	1000 ppm	1	4	Yes

DO 079799
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* See Industrial Hygiene Data Sheet.

** To be filled in by Industrial Hygiene.

FORM M-47710 PRINTED R-10-74

CHEMICAL AND PHYSICAL AGENT INVENTORY

SUPERINTENDENT NAME	PLANT	BUILDING NO.
WARREN CLARK	CHLOR-ALKALI II	3601

FILLED OUT BY	DATE
JACKIE PAUL	12/10/82

JOB CLASSIFICATION	INDEX NUMBER	NO. OF EMPLOYEES IN CLASSIFICATION
Caustic Area Engrs.		3

MATERIALS OR PHYSICAL AGENTS	INDUSTRIAL HYGIENE GUIDE ppm or mg/m³	* DEGREE OF EXPOSURE	** HAZARD RATING	DATA SHEET AVAILABLE
RAW MAT'L:				
Brine	10 mg/m³	2	4	Yes
PRODUCTS:				
Chlorine	1 ppm C	2	3	Yes
Caustic	2 mg/m³ C	2	4	Yes
Hydrogen	1000 ppm	1	4	Yes
BY-PRODUCTS:				
Chlorinated-Organics (Various)		1	4	Yes
Hypochlorites	N/E	1	4	Yes
ADDITIVES:				
Betz Chemicals (2020,2080,Sulphite 3, Balanced Polymer 6000)	N/E	1	4	Yes
CO_2	5000 ppm	1	4	Yes
HCl	7 mg/m³ C	1	4	Yes
H_2SO_4	1 mg/m³	1	4	Yes
Hydrogen Peroxide	1 ppm	2	4	Yes
Mg Chloride	N/E	1	4	Yes
Nalco Floc	N/E	1	4	Yes
Sodium Thiosulfate	10 mg/m³	1	3	Yes
PHYSICAL AGENTS:				
Heat		1	4	Yes
Noise	85 db(A)	2	4	Yes
UTILITIES:				
Condensate		1	5	No
Methane	Simple Asphy	1	4	Yes
Nitrogen	1000 ppm	1	4	Yes

DO 079800
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* See Industrial Hygiene Data Sheet.

** To be filled in by Industrial Hygiene.

FORM M-47750 PRINTED 8-10-74

CHEMICAL AND PHYSICAL AGENT INVENTORY

SUPERINTENDENT NAME	PLANT	BUILDING NO.
WARREN CLARK	CHLOR-ALKALI II	3601

FILLED OUT BY	DATE
JACKIE PAUL	12/10/82

JOB CLASSIFICATION	INDEX NUMBER	NO. OF EMPLOYEES IN CLASSIFICATION
Brine Area Engr.		1

MATERIALS OR PHYSICAL AGENTS	INDUSTRIAL HYGIENE GUIDE ppm or mg/m^3	* DEGREE OF EXPOSURE	** HAZARD RATING	DATA SHEET AVAILABLE
RAW MAT'L:				
Brine	10 mg/m^3	2	4	Yes
PRODUCTS:				
Chlorine	1 ppm C	2	3	Yes
Caustic	2 mg/m^3 C	2	4	Yes
Hydrogen	1000 ppm	2	4	Yes
BY-PRODUCTS:				
Chlorinated-Organics (Various)		1	4	Yes
Hypochlorites	N/E	2	4	Yes
ADDITIVES:				
Betz Chemicals (2020,2080,Sulphite 3, Balanced Polymer 6000)	N/E	1	4	Yes
CO_2	5000 ppm	1	4	Yes
HCl	7 mg/m^3 C	1	4	Yes
H_2SO_4	1 mg/m^3	1	4	Yes
Hydrogen Peroxide	1 ppm	1	4	Yes
Mg Chloride	N/E	1	4	Yes
Nalco Floc	N/E	2	4	Yes
Sodium Thiosulfate	10 mg/m^3	1	4	Yes
PHYSICAL AGENTS:				
Heat		1	4	Yes
Noise	85 db(A)	2	4	Yes
UTILITIES:				
Condensate		1	5	No
Methane	Simple Asphy.	1	4	Yes
Nitrogen	1000 ppm	1	4	Yes

DO 079801
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* See Industrial Hygiene Data Sheet.

** To be filled in by Industrial Hygiene.

FORM M-47710 PRINTED R-10-74

CHEMICAL AND PHYSICAL AGENT INVENTORY

SUPERINTENDENT NAME	PLANT	[illegible]
WARREN CLARK	CHLOR-ALKALI II	3601

FILLED OUT BY	DATE
JACKIE PAUL	12/10/82

JOB CLASSIFICATION	INDEX NUMBER	NO. OF EMPLOYEES IN CLASSIFICATION
Instrument & Calibration Engr.		1

MATERIALS OR PHYSICAL AGENTS	INDUSTRIAL HYGIENE GUIDE ppm or mg/m³	* DEGREE OF EXPOSURE	** HAZARD RATING	DATA SHEET AVAILABLE
RAW MAT'L:				
Brine	10 mg/m³	1	4	Yes
PRODUCTS:				
Chlorine	1 ppm C	2	3	Yes
Caustic	2 mg/m³ C	1	4	Yes
Hydrogen	1000 ppm	1	2	Yes
BY-PRODUCTS:				
Chlorinated-Organics (Various)		1	-	Yes
Hypochlorites	N/E	1	4	Yes
ADDITIVES:				
Betz Chemicals (2020,2080,Sulphite 3, Balanced Polymer 6000)	N/E		-	Yes
CO_2	5000 ppm		2	Yes
HCl	7 mg/m³ C		-	Yes
H_2SO_4	1 mg/m³	1	2	Yes
Hydrogen Peroxide	1 ppm	1	4	Yes
Mg Chloride	N/E		2	Yes
Nalco Floc	N/E	1	2	Yes
Sodium Thiosulfate	10 mg/m³	1	4	Yes
PHYSICAL AGENTS:				
Heat		1	4	Yes
Noise	85 db(A)	2	4	Yes
UTILITIES:				
Condensate		1	5	No
Methane	Simple Asphy.	1	4	Yes
Nitrogen	1000 ppm	1	2	Yes

DO 079802
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* See Industrial Hygiene Data Sheet.

** To be filled in by Industrial Hygiene.

FORM M-47710 PRINTED R-10-74

CHEMICAL AND PHYSICAL AGENT INVENTORY

SUPERINTENDENT NAME	PLANT	BUILDING NO.
WARREN CLARK	CHLOR-ALKALI II	3601

FILLED OUT BY	DATE
JACKIE PAUL	12/10/82

JOB CLASSIFICATION	INDEX NUMBER	NO. OF EMPLOYEES IN CLASSIFICATION
Cell Area Engr.		1

MATERIALS OR PHYSICAL AGENTS	INDUSTRIAL HYGIENE GUIDE ppm or mg/m^3	* DEGREE OF EXPOSURE	** HAZARD RATING	DATA SHEET AVAILABLE
RAW MAT'L:				
Brine	10 mg/m^3	2	4	Yes
PRODUCTS:				
Chlorine	1 ppm C	2	3	Yes
Caustic	2 mg/m^3 C	2	4	Yes
Hydrogen	1000 ppm	2	4	Yes
BY-PRODUCTS:				
Chlorinated-Organics (Various)		2	4	Yes
Hypochlorites	N/E	2	4	Yes
ADDITIVES:				
Betz Chemicals (2020,2080,Sulphite 3, Balanced Polymer 6000)	N/E	1	4	Yes
CO_2	5000 ppm	1	4	Yes
HCl	7 mg/m^3 C	2	4	Yes
H_2SO_4	1 mg/m^3	2	4	Yes
Hydrogen Peroxide	1 ppm	1	4	Yes
Mg Chloride	N/E	2	4	Yes
Nalco Floc	N/E	1	4	Yes
Sodium Thiosulfate	10 mg/m^3	1	4	Yes
PHYSICAL AGENTS:				
Heat		1	4	Yes
Noise	85 db(A)	2	4	Yes
UTILITIES:				
Condensate		1	5	No
Methane	Simple Asphy.	1	4	Yes
Nitrogen	1000 ppm	1	4	Yes

DO 079803
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* See Industrial Hygiene Data Sheet.

** To be filled in by Industrial Hygiene.

FORM M-47710 PRINTED R-10-74

CHEMICAL AND PHYSICAL AGENT INVENTORY

SUPERINTENDENT NAME	PLANT	
WARREN CLARK	CHLOR-ALKALI II	3601
FILLED OUT BY	**DATE**	
JACKIE PAUL	12/10/82	
JOB CLASSIFICATION	**INDEX NUMBER**	**NO. OF EMPLOYEES IN CLASSIFICATION**
Plant Operator		1

MATERIALS OR PHYSICAL AGENTS	INDUSTRIAL HYGIENE GUIDE ppm or mg./m3	* DEGREE OF EXPOSURE	** HAZARD RATING	DATA SHEET AVAILABLE
RAW MAT'L:				
Brine	10 mg/m^3	1	4	Yes
PRODUCTS:				
Chlorine	1 ppm C	2	3	Yes
Caustic	2 mg/m^3 C			Yes
Hydrogen	1000 ppm	1	4	Yes
BY-PRODUCTS:				
Chlorinated-Organics (Various)		1		Yes
Hypochlorites	N/E			Yes
ADDITIVES:				
Betz Chemicals (2020,2080,Sulphite 3, Balanced Polymer 6000)	N/E	1	4	Yes
CO_2	5000 ppm			Yes
HCl	7 mg/m^3 C			Yes
H_2SO_4	1 mg/m^3	1	4	Yes
Hydrogen Peroxide	1 ppm			Yes
Mg Chloride	N/E	1		Yes
Nalco Floc	N/E	1		Yes
Sodium Thiosulfate	10 mg/m^3	1		Yes
PHYSICAL AGENTS:				
Heat		1	4	Yes
Noise	85 db(A)	1	4	Yes
UTILITIES:				
Condensate		1	5	No
Methane	Simple Asphy	1	5	Yes
Nitrogen	1000 ppm	1	4	Yes

DO 079804
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* See Industrial Hygiene Data Sheet.

** To be filled in by Industrial Hygiene.

FORM M-4771C PRINTED 8-10-74

CHEMICAL AND PHYSICAL AGENT INVENTORY

SUPERINTENDENT NAME	PLANT	BUILDING NO.
WARREN CLARK	CHLOR-ALKALI II	3601

FILLED OUT BY	DATE
JACKIE PAUL	12/10/82

JOB CLASSIFICATION	INDEX NUMBER	NO. OF EMPLOYEES IN CLASSIFICATION
Cell Room Emp.		1

MATERIALS OR PHYSICAL AGENTS	INDUSTRIAL HYGIENE GUIDE ppm or mg/m³	* DEGREE OF EXPOSURE	** HAZARD RATING	DATA SHEET AVAILABLE
RAW MAT'L:				
Brine	10 mg/m³	1	4	Yes
PRODUCTS:				
Chlorine	1 ppm C	2	3	Yes
Caustic	2 mg/m³ C	1	4	Yes
Hydrogen	1000 ppm	1	4	Yes
BY-PRODUCTS:				
Chlorinated-Organics (Various)		1	4	Yes
Hypochlorites	N/E	1	4	Yes
ADDITIVES:				
Betz Chemicals (2020,2080,Sulphite 3, Balanced Polymer 6000)	N/E	1	4	Yes
CO_2	5000 ppm	1	4	Yes
HCl	7 mg/m³ C	1	4	Yes
H_2SO_4	1 mg/m³	1	4	Yes
Hydrogen Peroxide	1 ppm	1	4	Yes
Mg Chloride	N/E		2	Yes
Nalco Floc	N/E	1	4	Yes
Sodium Thiosulfate	10 mg/m³		4	Yes
PHYSICAL AGENTS:				
Heat		1	4	Yes
Noise	85 db(A)	1	4	Yes
UTILITIES:				
Condensate		1	5	No
Methane	Simple Asphy.	1	4	Yes
Nitrogen	1000 ppm	1	4	Yes

DO 079805
CONFIDENTIAL

* See Industrial Hygiene Data Sheet.

** To be filled in by Industrial Hygiene.

FORM M-47710 PRINTED 8-10-74

CHEMICAL AND PHYSICAL AGENT INVENTORY

SUPERINTENDENT NAME	PLANT	BUILDING NO.
WARREN CLARK	CHLOR-ALKALI II	3601

FILLED OUT BY	DATE
JACKIE PAUL	12/10/82

JOB CLASSIFICATION	INDEX NUMBER	NO. OF EMPLOYEES IN CLASSIFICATION
Power Area Engineers		2

MATERIALS OR PHYSICAL AGENTS	INDUSTRIAL HYGIENE GUIDE ppm or mg/m^3	* DEGREE OF EXPOSURE	** HAZARD RATING	DATA SHEET AVAILABLE
RAW MAT'L:				
Brine	10 mg/m^3	1	4	Yes
PRODUCTS:				
Chlorine	1 ppm C	2	3	Yes
Caustic	2 mg/m^3 C	1	4	Yes
Hydrogen	1000 ppm	1	4	Yes
BY-PRODUCTS:				
Chlorinated-Organics (Various)		1	4	Yes
Hypochlorites	N/E	1	4	Yes
ADDITIVES:				
Betz Chemicals (2020,2080,Sulphite 3, Balanced Polymer 6000)	N/E	2	4	Yes
CO_2	5000 ppm	1	4	Yes
HCl	7 mg/m^3 C	1	4	Yes
H_2SO_4	1 mg/m^3	1	4	Yes
Hydrogen Peroxide	1 ppm	1	4	Yes
Mg Chloride	N/E		4	Yes
Nalco Floc	N/E	1	4	Yes
Sodium Thiosulfate	10 mg/m^3	1	4	Yes
PHYSICAL AGENTS:				
Heat		1	4	Yes
Noise	85 db(A)	3	4	Yes
UTILITIES:				
Condensate		1	5	No
Methane	Simple Asphy.	1	4	Yes
Nitrogen	1000 ppm	1	4	Yes

DO 079806
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* See Industrial Hygiene Data Sheet.

** To be filled in by Industrial Hygiene.

FORM M-47790 PRINTED R-10-74

CHEMICAL AND PHYSICAL AGENT INVENTORY

SUPERINTENDENT NAME	PLANT	BUILDING NO.
WARREN CLARK	CHLOR-ALKALI II	3601

FILLED OUT BY	DATE
JACKIE PAUL	12/10/82

JOB CLASSIFICATION	INDEX NUMBER	NO. OF EMPLOYEES IN CLASSIFICATION
Cell Supervisor		1

MATERIALS OR PHYSICAL AGENTS	INDUSTRIAL HYGIENE GUIDE ppm or mg/m³	* DEGREE OF EXPOSURE	** HAZARD RATING	DATA SHEET AVAILABLE
RAW MAT'L:				
Brine	10 mg/m³	2	4	Yes
PRODUCTS:				
Chlorine	1 ppm C	2	3	Yes
Caustic	2 mg/m³ C	2	4	Yes
Hydrogen	1000 ppm		2	Yes
BY-PRODUCTS:				
Chlorinated-Organics (Various)		2	4	Yes
Hypochlorites	N/E	2	4	Yes
ADDITIVES:				
Betz Chemicals (2020,2080,Sulphite 3, Balanced Polymer 6000)	N/E	1	4	Yes
CO_2	5000 ppm	1	4	Yes
HCl	7 mg/m³ C	2	4	Yes
H_2SO_4	1 mg/m³	1	4	Yes
Hydrogen Peroxide	1 ppm	1	4	Yes
Mg Chloride	N/E	2	4	Yes
Nalco Floc	N/E	1	4	Yes
Sodium Thiosulfate	10 mg/m³	1	4	Yes
PHYSICAL AGENTS:				
Heat		1	4	Yes
Noise	85 db(A)	2	4	Yes
UTILITIES:				
Condensate		1	5	No
Methane	Simple Asphy.	1	4	Yes
Nitrogen	1000 ppm	1	4	Yes

DO 079807
CONFIDENTIAL

* See Industrial Hygiene Data Sheet.

** To be filled in by Industrial Hygiene.

FORM M-47710 PRINTED 8-10-74

CHEMICAL AND PHYSICAL AGENT INVENTORY

SUPERINTENDENT NAME	PLANT	BUILDING NO.
WARREN CLARK	CHLOR-ALKALI II	3601

FILLED OUT BY	DATE
JACKIE PAUL	12/10/82

JOB CLASSIFICATION	INDEX NUMBER	NO. OF EMPLOYEES IN CLASSIFICATION
Production Supervisor		1

MATERIALS OR PHYSICAL AGENTS	INDUSTRIAL HYGIENE GUIDE ppm or mg/m^3	* DEGREE OF EXPOSURE	** HAZARD RATING	DATA SHEET AVAILABLE
RAW MAT'L:				
Brine	10 mg/m^3	1	4	Yes
PRODUCTS:				
Chlorine	1 ppm C	2	3	Yes
Caustic	2 mg/m^3 C	1	4	Yes
Hydrogen	1000 ppm	1	4	Yes
BY-PRODUCTS:				
Chlorinated-Organics (Various)		1	4	Yes
Hypochlorites	N/E	1	4	Yes
ADDITIVES:				
Betz Chemicals (2020,2080,Sulphite 3, Balanced Polymer 6000)	N/E	1	4	Yes
CO_2	5000 ppm	1	4	Yes
HCl	7 mg/m^3 C	1	4	Yes
H_2SO_4	1 mg/m^3	1	4	Yes
Hydrogen Peroxide	1 ppm	1	4	Yes
Mg Chloride	N/E	1	4	Yes
Nalco Floc	N/E	1	4	Yes
Sodium Thiosulfate	10 mg/m^3	1	4	Yes
PHYSICAL AGENTS:				
Heat		1	4	Yes
Noise	85 db(A)	2	4	Yes
UTILITIES:				
Condensate		1	5	No
Methane	Simple Asphy	1	4	Yes
Nitrogen	1000 ppm	1	4	Yes

DO 079808
CONFIDENTIAL

* See Industrial Hygiene Data Sheet.

** To be filled in by Industrial Hygiene.

FORM M-47710 PRINTED R-10-74

CHEMICAL AND PHYSICAL AGENT INVENTORY

SUPERINTENDENT NAME	PLANT	BUILDING NO.
WARREN CLARK	CHLOR-ALKALI II	3601

FILLED OUT BY	DATE
JACKIE PAUL	12/10/82

JOB CLASSIFICATION	INDEX NUMBER	NO. OF EMPLOYEES IN CLASSIFICATION
Plant Supt.		1

MATERIALS OR PHYSICAL AGENTS	INDUSTRIAL HYGIENE GUIDE ppm or mg/m^3	* DEGREE OF EXPOSURE	** HAZARD RATING	DATA SHEET AVAILABLE
RAW MAT'L:				
Brine	10 mg/m^3	1	4	Yes
PRODUCTS:				
Chlorine	1 ppm C	2	3	Yes
Caustic	2 mg/m^3 C	1	4	Yes
Hydrogen	1000 ppm	1	4	Yes
BY-PRODUCTS:				
Chlorinated-Organics (Various)		1	4	Yes
Hypochlorites	N/E	1	4	Yes
ADDITIVES:				
Betz Chemicals (2020,2080,Sulphite 3, Balanced Polymer 6000)	N/E	1	4	Yes
CO_2	5000 ppm	1	4	Yes
HCl	7 mg/m^3 C	1	4	Yes
H_2SO_4	1 mg/m^3	1	4	Yes
Hydrogen Peroxide	1 ppm	1	4	Yes
Mg Chloride	N/E	1	4	Yes
Nalco Floc	N/E	1	4	Yes
Sodium Thiosulfate	10 mg/m^3	1	4	Yes
PHYSICAL AGENTS:				
Heat		1	4	Yes
Noise	85 db(A)	2	4	Yes
UTILITIES:				
Condensate		1	5	No
Methane	Simple Asphy.	1	4	Yes
Nitrogen	1000 ppm	1	4	Yes

DO 079809
CONFIDENTIAL

* See Industrial Hygiene Data Sheet.

** To be filled in by Industrial Hygiene.

FORM M-47710 PRINTED 8-10-74

CHEMICAL AND PHYSICAL AGENT INVENTORY

SUPERINTENDENT NAME	PLANT	BUILDING NO.
WARREN CLARK	CHLOR-ALKALI II	3601

FILLED OUT BY	DATE
JACKIE PAUL	12/10/82

JOB CLASSIFICATION	INDEX NUMBER	NO OF EMPLOYEES IN CLASSIFICATION
Instruments		7

MATERIALS OR PHYSICAL AGENTS	INDUSTRIAL HYGIENE GUIDE ppm or mg/m³	* DEGREE OF EXPOSURE	** HAZARD RATING	DATA SHEET AVAILABLE
RAW MAT'L:				
Brine	10 mg/m³	2	4	Yes
PRODUCTS:				
Chlorine	1 ppm C	2	3	Yes
Caustic	2 mg/m³C	2	3	Yes
Hydrogen	1000 ppm	1	4	Yes
BY-PRODUCTS:				
Chlorinated-Organics (Various)		1	4	Yes
Hypochlorites	N/E	1	4	Yes
ADDITIVES:				
Betz Chemicals (2020,2080,Sulphite 3, Balanced Polymer 6000)	N/E	1	4	Yes
CO_2	5000 ppm	1	4	Yes
HCl	7 mg/m³ C	2	3	Yes
H_2SO_4	1 mg/m³	2	3	Yes
Hydrogen Peroxide	1 ppm	1	4	Yes
Mg Chloride	N/E	1	4	Yes
Nalco Floc	N/E	1	4	Yes
Sodium Thiosulfate	10 mg/m³	1	4	Yes
PHYSICAL AGENTS:				
Heat		1	4	Yes
Noise	85 db(A)	2	3	Yes
UTILITIES:				
Condensate		1	5	No
Methane	Simple Asphy.	1	4	Yes
Nitrogen	1000 ppm	1	4	Yes

DO 079810
CONFIDENTIAL

* See Industrial Hygiene Data Sheet.

** To be filled in by Industrial Hygiene.

FORM M-47710 PRINTED R-10-74

CHEMICAL AND PHYSICAL AGENT INVENTORY

SUPERINTENDENT NAME	PLANT	BUILDING NO.
WARREN CLARK	CHLOR-ALKALI II	3601

FILLED OUT BY	DATE
JACKIE PAUL	12/10/82

JOB CLASSIFICATION	INDEX NUMBER	NO. OF EMPLOYEES IN CLASSIFICATION
Lab Personnel Chemist & Env Tech.		2

MATERIALS OR PHYSICAL AGENTS	INDUSTRIAL HYGIENE GUIDE ppm or mg/m³	* DEGREE OF EXPOSURE	** HAZARD RATING	DATA SHEET AVAILABLE
RAW MAT'L:				
Brine	10 mg/m³	3	4	Yes
PRODUCTS:				
Chlorine	1 ppm C	3	3	Yes
Caustic	2 mg/m³ C	3	4	Yes
Hydrogen	1000 ppm	2	4	Yes
BY-PRODUCTS:				
Chlorinated-Organics (Various)		1	4	Yes
Hypochlorites	N/E	2	4	Yes
ADDITIVES:				
Betz Chemicals (2020,2080,Sulphite 3, Balanced Polymer 6000)	N/E	1	4	Yes
CO_2	5000 ppm	1	4	Yes
HCl	7 mg/m³ C	3	4	Yes
H_2SO_4	1 mg/m³	3	4	Yes
Hydrogen Peroxide	1 ppm	1	4	Yes
Mg Chloride	N/E	1	4	Yes
Nalco Floc	N/E	1	4	Yes
Sodium Thiosulfate	10 mg/m³	3	4	Yes
PHYSICAL AGENTS:				
Heat		1	4	Yes
Noise	85 db(A)	2	4	Yes
UTILITIES:				
Condensate		1	5	No
Methane	Simple Asphy.	1	4	Yes
Nitrogen	1000 ppm	1	4	Yes

DO 079811
CONFIDENTIAL

* See Industrial Hygiene Data Sheet.

** To be filled in by Industrial Hygiene.

FORM M-47710 PRINTED R-10-74

CHEMICAL AND PHYSICAL AGENT INVENTORY

EMPLOYEE NAME	PLANT	LOCATION
WARREN CLARK	CHLOR-ALKALI II	3601

FILLED OUT BY	DATE
JACKIE PAUL	12/10/82

JOB CLASSIFICATION	INDEX NUMBER	NO OF EMPLOYEE IN CLASSIFICATION
Unit Project Supervisor		1

MATERIALS OR PHYSICAL AGENTS	INDUSTRIAL HYGIENE GUIDE ppm or mg/m^3	* DEGREE OF EXPOSURE	** HAZARD RATING	DATA SHEET AVAILABLE
RAW MAT'L:				
Brine	10 mg/m^3	1	4	Yes
PRODUCTS:				
Chlorine	1 ppm C	2	3	Yes
Caustic	2 mg/m^3 C	1	4	Yes
Hydrogen	1000 ppm	1	4	Yes
BY-PRODUCTS:				
Chlorinated-Organics (Various)		1	4	Yes
Hypochlorites	N/E	1	4	Yes
ADDITIVES:				
Betz Chemicals (2020,2080,Sulphite 3, Balanced Polymer 6000)	N/E	1	4	Yes
CO_2	5000 ppm	1	4	Yes
HCl	7 mg/m^3 C	1	4	Yes
H_2SO_4	1 mg/m^3	1	4	Yes
Hydrogen Peroxide	1 ppm	1	4	Yes
Mg Chloride	N/E	1	4	Yes
Nalco Floc	N/E	1	4	Yes
Sodium Thiosulfate	10 mg/m^3	1	4	Yes
PHYSICAL AGENTS:				
Heat		1	4	Yes
Noise	85 db(A)	2	4	Yes
UTILITIES:				
Condensate		1	5	No
Methane	Simple Asphy.	1	4	Yes
Nitrogen	1000 ppm	1	4	Yes

DO 079812
CONFIDENTIAL

* See Industrial Hygiene Data Sheet.

** To be filled in by Industrial Hygiene.

CHEMICAL AND PHYSICAL AGENT INVENTORY

SUPERINTENDENT NAME	PLANT	BUILDING NO.
WARREN CLARK	CHLOR-ALKALI II	3601

FILLED OUT BY	DATE
JACKIE PAUL	12/10/82

JOB CLASSIFICATION	INDEX NUMBER	NO. OF EMPLOYEES IN CLASSIFICATION
Safety and Training Supervisor		1

MATERIALS OR PHYSICAL AGENTS	INDUSTRIAL HYGIENE GUIDE ppm or mg/m^3	* DEGREE OF EXPOSURE	** HAZARD RATING	DATA SHEET AVAILABLE
RAW MAT'L:				
Brine	10 mg/m^3	1	4	Yes
PRODUCTS:				
Chlorine	1 ppm C	2	3	Yes
Caustic	2 mg/m^3 C	1	4	Yes
Hydrogen	1000 ppm	1	4	Yes
BY-PRODUCTS:				
Chlorinated-Organics (Various)		1	4	Yes
Hypochlorites	N/E	1	4	Yes
ADDITIVES:				
Betz Chemicals (2020,2080,Sulphite 3, Balanced Polymer 6000)	N/E	1	4	Yes
CO_2	5000 ppm	1	4	Yes
HCl	7 mg/m^3 C	1	4	Yes
H_2SO_4	1 mg/m^3	1	4	Yes
Hydrogen Peroxide	1 ppm	1	4	Yes
Mg Chloride	N/E	1	4	Yes
Nalco Floc	N/E	1	4	Yes
Sodium Thiosulfate	10 mg/m^3	1	4	Yes
PHYSICAL AGENTS:				
Heat		1	4	Yes
Noise	85 db(A)	2	4	Yes
UTILITIES:				
Condensate		1	5	No
Methane	Simple Asphy.	1	4	Yes
Nitrogen	1000 ppm	1	4	Yes

DO 079813
CONFIDENTIAL

* See Industrial Hygiene Data Sheet.

** To be filled in by Industrial Hygiene.

FORM M-47290 PRINTED R-10-74

CHEMICAL AND PHYSICAL AGENT INVENTORY

SUPERINTENDENT NAME	PLANT	BUILDING NO.
WARREN CLARK	CHLOR-ALKALI II	3601

FILLED OUT BY	DATE
JACKIE PAUL	12/10/82

JOB CLASSIFICATION	INDEX NUMBER	NO. OF EMPLOYEES IN CLASSIFICATION
Office Personnel (Secretary & Computer Tech.		2

MATERIALS OR PHYSICAL AGENTS	INDUSTRIAL HYGIENE GUIDE ppm or mg/m³	* DEGREE OF EXPOSURE	** HAZARD RATING	DATA SHEET AVAILABLE
RAW MAT'L:				
Brine	10 mg/m³	1	4	Yes
PRODUCTS:				
Chlorine	1 ppm C	2	4	Yes
Caustic	2 mg/m³ C	1	4	Yes
Hydrogen	1000 ppm	1	4	Yes
BY-PRODUCTS:				
Chlorinated-Organics (Various)		1	4	Yes
Hypochlorites	N/E	1	4	Yes
ADDITIVES:				
Betz Chemicals (2020,2080,Sulphite 3, Balanced Polymer 6000)	N/E	1	4	Yes
CO_2	5000 ppm	1	4	Yes
HCl	7 mg/m³ C	1	4	Yes
H_2SO_4	1 mg/m³	1	4	Yes
Hydrogen Peroxide	1 ppm	1	4	Yes
Mg Chloride	N/E		4	Yes
Nalco Floc	N/E	1	4	Yes
Sodium Thiosulfate	10 mg/m³	1	4	Yes
PHYSICAL AGENTS:				
Heat		1	4	Yes
Noise	85 db(A)	1	4	Yes
UTILITIES:				
Condensate		1	5	No
Methane	Simple Asphy.	1	4	Yes
Nitrogen	1000 ppm	1	4	Yes

DO 079814
CONFIDENTIAL

* See Industrial Hygiene Data Sheet.

** To be filled in by Industrial Hygiene.

FORM M-47710 PRINTED R-10-74

CHEMICAL AND PHYSICAL AGENT INVENTORY

SUPERINTENDENT NAME	PLANT	BUILDING NO.
WARREN CLARK	CHLOR-ALKALI II	3601

FILLED OUT BY	DATE
JACKIE PAUL	12/10/82

JOB CLASSIFICATION	INDEX NUMBER	NO. OF EMPLOYEES IN CLASSIFICATION
Maintenance Supervisor		1

MATERIALS OR PHYSICAL AGENTS	INDUSTRIAL HYGIENE GUIDE ppm or mg/m^3	* DEGREE OF EXPOSURE	** HAZARD RATING	DATA SHEET AVAILABLE
RAW MAT'L:				
Brine	10 mg/m^3	1	4	Yes
PRODUCTS:				
Chlorine	1 ppm C	2	3	Yes
Caustic	2 mg/m^3 C	2	4	Yes
Hydrogen	1000 ppm	1	4	Yes
BY-PRODUCTS:				
Chlorinated-Organics (Various)		1	4	Yes
Hypochlorites	N/E	1	4	Yes
ADDITIVES:				
Betz Chemicals (2020,2080,Sulphite 3, Balanced Polymer 6000)	N/E	1	4	Yes
CO_2	5000 ppm	1	4	Yes
HCl	7 mg/m^3 C	1	4	Yes
H_2SO_4	1 mg/m^3	1	4	Yes
Hydrogen Peroxide	1 ppm	1	4	Yes
Mg Chloride	N/E	1	4	Yes
Nalco Floc	N/E	1	4	Yes
Sodium Thiosulfate	10 mg/m^3	1	4	Yes
PHYSICAL AGENTS:				
Heat		1	4	Yes
Noise	85 db(A)	2	4	Yes
UTILITIES:				
Condensate		1	5	No
Methane	Simple Asphy.	1	4	Yes
Nitrogen	1000 ppm	1	4	Yes

* See Industrial Hygiene Data Sheet.

** To be filled in by Industrial Hygiene.

DO 079815
CONFIDENTIAL

FORM M-4771C PRINTED R-10-74

CHEMICAL AND PHYSICAL AGENT INVENTORY

SUPERINTENDENT NAME	PLANT	BUILDING NO.
WARREN CLARK	CHLOR-ALKALI II	3601

FILLED OUT BY	DATE
JACKIE PAUL	12/10/82

JOB CLASSIFICATION	INDEX NUMBER	NO. OF EMPLOYEES IN CLASSIFICATION
Material Controller		1

MATERIALS OR PHYSICAL AGENTS	INDUSTRIAL HYGIENE GUIDE ppm or mg/m³	* DEGREE OF EXPOSURE	** HAZARD RATING	DATA SHEET AVAILABLE
RAW MAT'L:				
Brine	10 mg/m³	1	4	Yes
PRODUCTS:				
Chlorine	1 ppm C	2	3	Yes
Caustic	2 mg/m³ C	1	4	Yes
Hydrogen	1000 ppm	1	4	Yes
BY-PRODUCTS:				
Chlorinated-Organics (Various)		1	4	Yes
Hypochlorites	N/E	1	4	Yes
ADDITIVES:				
Betz Chemicals (2020,2080,Sulphite 3, Balanced Polymer 6000)	N/E	1	4	Yes
CO_2	5000 ppm	1	4	Yes
HCl	7 mg/m³ C	1	4	Yes
H_2SO_4	1 mg/m³	1	4	Yes
Hydrogen Peroxide	1 ppm	1	4	Yes
Mg Chloride	N/E	1	4	Yes
Nalco Floc	N/E	1	4	Yes
Sodium Thiosulfate	10 mg/m³	1	4	Yes
PHYSICAL AGENTS:				
Heat		1	4	Yes
Noise	85 db(A)	2	4	Yes
UTILITIES:				
Condensate		1	5	No
Methane	Simple Asphy.	1	4	Yes
Nitrogen	1000 ppm	1	4	Yes

DO 079816
CONFIDENTIAL

* See Industrial Hygiene Data Sheet.

** To be filled in by Industrial Hygiene.

FORM M-47710 PRINTED R-10-74

1982 INDEX RECORD (IND. HYGIENE TRAINING)

DO 079817
CONFIDENTIAL

DEPARTMENT CAH Section _____

Plant CAH Quarter 1Q Year 1990

Industrial Hygiene Reporting Index = $\frac{B}{A}$ x 100 100%

Percent of Employees trained, last 12 months.

A. Total Number of Individuals with Potential Overexposure 74

B. Total Number of Individuals Trained, Last 4 Quarters, including new employees: 76

C. Total Number of Individuals Trained this Quarter 0

D. Total Number of Individuals Trained YTD. 0

Percent of employees trained YTD 0%

When meetings are held to cover this information, attendance and a summary of the subject(s) covered are required for documentation of effort.

EMPLOYEE EDUCATION CRITERIA

All production plants and laboratories should cover the following information with each employee to claim credit for training completion. This information should be covered annually for all employees. The chemical and physical agent inventory sheets (CPI) provide the list of materials which need to be covered. The CPI should be updated annually.

1. Consequences of Overexposure - All materials on the CPI with a hazard rating of 1-4 should be reviewed. Basic details of the potential adverse health effects that can occur from excessive exposure to the chemical and physical agents in your plant or laboratory.

2. Evidence of Exposure Control - Data or documentation should be available for each material with a 1-3 hazard rating.

3. Control Measures - Specific methods available to minimize employee exposures, such as ventilation, respirtory protection and protective clothing.

Completed by: J. Paul

DO 079818
CONFIDENTIAL

QUARTERLY INDUSTRIAL HYGIENE REPORTING INDEX

DIVISION CAT II QUARTER 2nd YEAR 1982

INDUSTRIAL HYGIENE REPORTING INDEX = $\frac{B}{A} \times 100$

A. TOTAL NUMBER OF INDIVIDUALS WITH POTENTIAL OVEREXPOSURE 73

B. TOTAL NUMBER OF INDIVIDUALS TRAINED, LAST FOUR QUARTERS, INCLUDING NEW EMPLOYEES 66

C. TOTAL NUMBER OF INDIVIDUALS TRAINED, THIS QUARTER 53

D. TOTAL NUMBER OF INDIVIDUALS TRAINED, YEAR TO DATE (YTD) 53

PERCENT OF EMPLOYEES TRAINED, YTD 73%

WHEN MEETINGS ARE HELD TO COVER THIS INFORMATION, ATTENDANCE AND A SUMMARY OF THE SUBJECT(S) COVERED ARE REQUIRED FOR DOCUMENTATION OF EFFORT.

EMPLOYEE EDUCATION CRITERIA

ALL PRODUCATION PLANTS AND LABORATORIES SHOULD COVER THE FOLLOWING INFORMATION WITH EACH EMPLOYEE TO COMPLETE TRAINING REQUIREMENTS. THIS INFORMATION SHOULD BE COVERED ANNUAL FOR ALL EMPLOYEES. THE CHEMICAL AND PHYSICAL AGENT (C&PA). INVENTORY SHEETS PROVIDE THE LIST OF MATERIALS WHICH NEED TO BE COVERED. THE C&PA INVENTORY SHOULD BE UPDATED ANNUALLY.

1. CONSEQUENCES OF OVEREXPOSURE -- ALL MATERIALS ON THE C&PA INVENTORY WITH A HAZARD RATING OF 1-4 SHOULD BE REVIEWED. BASIC DETAILS OF THE POTENTIAL ADVERSE HEALTH EFFECTS THAT CAN OCCUR FROM EXCESSIVE EXPOSURE TO THE CHEMICAL AND PHYSICAL AGENTS IN THE PLANT OR LABORATORY.

2. EVIDENCE OF EXPOSURE CONTROL -- DATA OR DOCUMENTATION SHOULD BE AVAILABLE FOR EACH MATERIAL WITH A HAZARD RATING OF 1-3.

3. CONTROL MEASURES -- SPECIFIC METHODS AVAILABLE TO MINIMIZE EMPLOYEE EXPOSURES, SUCH AS VENTILATION, RESPIRATORY PROTECTION AND PROTECTIVE CLOTHING.

COMPLETED BY J. Paul DATE 10/12/82

DO 079819
CONFIDENTIAL

QUARTERLY INDUSTRIAL HYGIENE REPORTING INDEX

DIVISION CAT II QUARTER 3rd YEAR 1982

INDUSTRIAL HYGIENE REPORTING INDEX = $\frac{B}{A}$ X 100

A.	TOTAL NUMBER OF INDIVIDUALS WITH POTENTIAL OVEREXPOSURE	73
B.	TOTAL NUMBER OF INDIVIDUALS TRAINED, LAST FOUR QUARTERS, INCLUDING NEW EMPLOYEES	81
C.	TOTAL NUMBER OF INDIVIDUALS TRAINED, THIS QUARTER	0
D.	TOTAL NUMBER OF INDIVIDUALS TRAINED, YEAR TO DATE (YTD)	53
	PERCENT OF EMPLOYEES TRAINED, YTD	73%

WHEN MEETINGS ARE HELD TO COVER THIS INFORMATION, ATTENDANCE AND A SUMMARY OF THE SUBJECT(S) COVERED ARE REQUIRED FOR DOCUMENTATION OF EFFORT.

EMPLOYEE EDUCATION CRITERIA

ALL PRODUCATION PLANTS AND LABORATORIES SHOULD COVER THE FOLLOWING INFORMATION WITH EACH EMPLOYEE TO COMPLETE TRAINING REQUIREMENTS. THIS INFORMATION SHOULD BE COVERED ANNUAL FOR ALL EMPLOYEES. THE CHEMICAL AND PHYSICAL AGENT (C&PA). INVENTORY SHEETS PROVIDE THE LIST OF MATERIALS WHICH NEED TO BE COVERED. THE C&PA INVENTORY SHOULD BE UPDATED ANNUALLY.

1. CONSEQUENCES OF OVEREXPOSURE -- ALL MATERIALS ON THE C&PA INVENTORY WITH A HAZARD RATING OF 1-4 SHOULD BE REVIEWED. BASIC DETAILS OF THE POTENTIAL ADVERSE HEALTH EFFECTS THAT CAN OCCUR FROM EXCESSIVE EXPOSURE TO THE CHEMICAL AND PHYSICAL AGENTS IN THE PLANT OR LABORATORY.

2. EVIDENCE OF EXPOSURE CONTROL -- DATA OR DOCUMENTATION SHOULD BE AVAILABLE FOR EACH MATERIAL WITH A HAZARD RATING OF 1-3.

3. CONTROL MEASURES -- SPECIFIC METHODS AVAILABLE TO MINIMIZE EMPLOYEE EXPOSURES, SUCH AS VENTILATION, RESPIRATORY PROTECTION AND PROTECTIVE CLOTHING.

COMPLETED BY J. Paul DATE 10/12/82

DO 079820
CONFIDENTIAL

QUARTERLY INDUSTRIAL HYGIENE REPORTING INDEX

DIVISION CA II QUARTER 4th YEAR 1982

INDUSTRIAL HYGIENE REPORTING INDEX = $\frac{B}{A} \times 100$

A.	TOTAL NUMBER OF INDIVIDUALS WITH POTENTIAL OVEREXPOSURE	72
B.	TOTAL NUMBER OF INDIVIDUALS TRAINED, LAST FOUR QUARTERS, INCLUDING NEW EMPLOYEES	76
C.	TOTAL NUMBER OF INDIVIDUALS TRAINED, THIS QUARTER	18
D.	TOTAL NUMBER OF INDIVIDUALS TRAINED, YEAR TO DATE (YTD)	71
	PERCENT OF EMPLOYEES TRAINED, YTD	105%

WHEN MEETINGS ARE HELD TO COVER THIS INFORMATION, ATTENDANCE AND A SUMMARY OF THE SUBJECT(S) COVERED ARE REQUIRED FOR DOCUMENTATION OF EFFORT.

EMPLOYEE EDUCATION CRITERIA

ALL PRODUCATION PLANTS AND LABORATORIES SHOULD COVER THE FOLLOWING INFORMATION WITH EACH EMPLOYEE TO COMPLETE TRAINING REQUIREMENTS. THIS INFORMATION SHOULD BE COVERED ANNUAL FOR ALL EMPLOYEES. THE CHEMICAL AND PHYSICAL AGENT (C&PA). INVENTORY SHEETS PROVIDE THE LIST OF MATERIALS WHICH NEED TO BE COVERED. THE C&PA INVENTORY SHOULD BE UPDATED ANNUALLY.

1. CONSEQUENCES OF OVEREXPOSURE -- ALL MATERIALS ON THE C&PA INVENTORY WITH A HAZARD RATING OF 1-4 SHOULD BE REVIEWED. BASIC DETAILS OF THE POTENTIAL ADVERSE HEALTH EFFECTS THAT CAN OCCUR FROM EXCESSIVE EXPOSURE TO THE CHEMICAL AND PHYSICAL AGENTS IN THE PLANT OR LABORATORY.

2. EVIDENCE OF EXPOSURE CONTROL -- DATA OR DOCUMENTATION SHOULD BE AVAILABLE FOR EACH MATERIAL WITH A HAZARD RATING OF 1-3.

3. CONTROL MEASURES -- SPECIFIC METHODS AVAILABLE TO MINIMIZE EMPLOYEE EXPOSURES, SUCH AS VENTILATION, RESPIRATORY PROTECTION AND PROTECTIVE CLOTHING.

COMPLETED BY J. Paul DATE 1/11/83

DO 079821
CONFIDENTIAL

1983 SAMPLING SCHEDULE

DO 079822
CONFIDENTIAL

CA II SAMPLING SCHEDULE 1983 (BY HAZARD)

HAZARD	NO. OF SAMPLES
ASBESTOS	12
CAUSTIC	23
CHLORINE	24
NOISE	23

CA II SAMPLING SCHEDULE - 1983 (BY AREA)

BRINE AREA	NO. OF SAMPLES
NOISE	2
LIQUEFACTION	
CHLORINE	8
NOISE	3
CELLS	
CHLORINE	8
ASBESTOS	12
NOISE	3
CELL CREW	
CHLORINE	8
NaOH	8
POWER	
NOISE	8

DO 079824
CONFIDENTIAL

CAUSTIC	NO. OF SAMPLES
NaOH	15
NOISE	7

EXCURSION ON INSTRUMENTS & CRAFT 25%

1983 INDUSTRIAL HYGIENE GOALS

1983 INDUSTRIAL HYGIENE GOALS

I. CAUSTIC AREA — RESPONSIBILITY: ROBIN ROSS

A. STEAM TRACING DISCHARGES WHICH HAVE PRIVIOUSLY BEEN BLOWN OUT TO ATMOSPHERE WILL BE COLLECTED AS CONDENSATE RECOVERY.

EXP. COMPLETION: 3RD QUARTER COST: $25M

B. DEMISTER 301 HAS BEEN A SOURCE OF CAUSTIC MIST AND IS BEING REPLACED WITH A NEW ONE.

EXP. COMPLETION: 2ND QUARTER COST: $350M

C. CENTRIFUGE FEED PIPING WILL BE INSULATED TO PROTECT FROM THERMAL BURN AND CHUTE VENTS WILL BE ENLARGED TO REDUCE PRESSURE AND BETTER CONTROL CAUSTIC MIST..

EXP. COMPLETION: 2ND QUARTER COST: $80M

D. NON-ROUTINE CAUSTIC SAMPLE STATIONS WILL BE MODIFIED TO REDUCE POTENTIAL FOR SKIN EXPOSURE.

EXP. COMPLETION: 4TH QUARTER COST: $25M

E. OBSOLETE CAUSTIC PUMPS WILL BE REPLACED WITH DURCO PUMPS AND SPLASH GUARDS INSTALLED AROUND THEM. IN THE PAST THESE OBSOLETE PUMPS HAVE BEEN A SOURCE OF LEAKS.

EXP. COMPLETION: 4TH QUARTER COST: $605M

II. LIQUEFACTION AREA RESPONSIBILITY: SHARON HUTCHINSON

A. T-505 PH SAMPLE FLOWS TO THE DITCH SOMETIMES FLASHING OFF CHLORINE. THIS LINE WILL BE RUN TO D-232 CHLORINATED WATER POT.

EXP. COMPLETION: 2ND QUARTER COST: $1200

B. DESIGN A SYSTEM TO AUTO SWAP BRINE SCRUBBER VENT TO T-210 ON T-505 LOW PH TO ELIMINATE CHLORINE EMISSION FROM THIS VENT.

EXP. COMPLETION: 4TH QUARTER

III. POWER AREA RESPONSIBILITY: BILL SHARKEY

A. INSTALL SOUND ENCLOSURES AROUND GENERATOR COUPLING AREAS.

EXP. COMPLETION: 3RD QUARTER COST: $20,000

B. INSTALL MUFFLERS ON ALL AIR BLEEDS AT T-401, C-402, E-401 AND D-406

EXP. COMPLETION: 2ND QUARTER COST: $5,000

C. INSTALL A NOISE ATTENUATOR AT THE 235# TO 30# STEAM STATION.

EXP. COMPLETION: 2ND QUARTER COST: $10,000

D. REROUTE E-404 CONDENSATE TO D-402

EXP. COMPLETION: 2ND QUARTER COST: $4,000

E. REINSULATE HRU #1

EXP. COMPLETION: 2ND QUARTER COST: $500,000

F. PIPE 600# AND 115# ECONOMIZER HIGH POINT VENTS TO THE TRENCH.

EXP. COMPLETION: 1ST QUARTER COST: $5,000