

LOUISIANA DIVISION INDUSTRIAL HYGIENE REPORT
AN OPERATING UNIT OF THE DOW CHEMICAL COMPANY

DEPARTMENT	FILE NUMBER	DATE
SOLVENTS / EDC 1	LAD - SOLV/EDC - 88.01	12-08-89

TITLE

SOLVENTS / EDC 1 INDUSTRIAL HYGIENE ACTIVITY REPORT - 1988

AUTHOR	SIGNATURE
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MICHAEL S. BROWN

REVIEWER	SIGNATURE
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BRUCE A. HEINZE

SUMMARY OF 1988

PERSONNEL MONITORING WAS CONDUCTED ON 18 DOW OPERATIONS PERSONNEL AND ON 7 CONTRACT MAINTENANCE PERSONNEL. ALSO INCLUDED IN THE SURVEY WERE SAMPLES FROM 4 AREAS WITH POTENTIAL EXPOSURE PROBLEMS. INDUSTRIAL HYGIENE MONITORING IN 1988 CONCENTRATED ON TASK ORIENTATED SAMPLES THAT HAD POTENTIALLY HIGH SHORT TERM EXPOSURE.

ALSO, THERE WERE 6 SAMPLES TAKEN IMMEDIATELY AFTER A SPILL DUE TO A BLOWN RUPTURE DISC ON R-1C (P/T REACTOR). THESE SAMPLES PROVIDED VALUABLE DATA AS TO THE AREA OF CONTAMINATION AND DECIDING ON THE CORRECT LEVEL OF PROPER PERSONNEL PROTECTION NEEDED.)

THE SAMPLING CONSISTED OF TWO PHASES, RCL'S AND HEXES, AND THE APPROVED METHODS FOR EACH OF THESE WAS USED. COMPOUNDS ANALYZED FOR IN THE RCL SURVEY WERE : CARBON TETRACHLORIDE, ETHYLENE DICHLORIDE, PROPYLENE DICHLORIDE, PERCHLOROETHYLENE, AND BETA-TRI. COMPOUNDS ANALYZED FOR IN THE HEX SURVEY WERE : HEXACHLOROETHANE, HEXACHLOROBUTADIENE, AND HEXACHLOROBENZENE.

ANALYSES PERFORMED SUPPORT HISTORICAL DATA THAT INDICATES THERE ARE NO UNKNOWN EXPOSURE PROBLEMS. DATA ALSO CONFIRMS SOME ALREADY KNOWN POTENTIAL EXPOSURE PROBLEMS.)

ADDITIONALLY, AN AREA NOISE SURVEY WAS CONDUCTED AND THE RESULTS WERE PRESENTED TO ALL EMPLOYEES DURING THE SOLVENTS / EDC 1 ANNUAL REVIEW OF ALL INDUSTRIAL HYGIENE CONCERNS (TOXIC CHEMICAL REVIEW, CONSEQUENCES OF OVEREXPOSURE, AND HEARING CONSERVATION PROGRAM).

GOALS FOR 1989 :

1. INCORPERATING MORE EMPLOYEES INTO OUR PROGRAM.
2. A GREATER SAMPLING FREQUENCY.
3. PERSONNEL NOISE SURVEY.
4. CONTINUE HEX WIPE SAMPLING.

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RESTRICTED: FOR USE WITHIN THE DOW CHEMICAL COMPANY ONLY

DOW CHEMICAL LAD
SOLVENTS / EDC 1

SOLVENTS PROCESS DESCRIPTION

IN THE SOLVENTS PLANT, CARBON TETRACHLORIDE AND PERCHLOROETHYLENE ARE SYNTHESIZED WHEN A THERMAL CHLORINATION REACTION OCCURS BETWEEN CHLORINE AND VAPORIZED HYDROCARBONS. THE REACTION IS CONTROLLED IN A CHLORINE EXCESS BY THE ADDITION OF DILUENT (LIQUID OR VAPOR) TO THE REACTOR INLET LINE. AFTER THE REACTION IS QUENCHED, THE CRUDE REACTOR PRODUCT FIRST UNDERGOES A LIGHTS REMOVAL PHASE. IN THIS PHASE, THE CHLORINE REMOVED IS RECYCLED BACK TO REACTOR, AND THE HYDROGEN CHLORIDE REMOVED IS EITHER SENT TO THE VINYL II PLANT AS A RAW MATERIAL IN THE PRODUCTION OF ETHYLENE DICHLORIDE OR SENT TO THE ACID SECTION OF THE PLANT AND USED AS A RAW MATERIAL IN THE PRODUCTION OF HYDROCHLORIC ACID. THE NEXT PHASE OF THE DISTILLATION PROCESS OCCURS WHEN THE CARBON TETRACHLORIDE IS DISTILLED FROM THE PERCHLOROETHYLENE AND HEAVIES. THE FINAL PHASE IN THE DISTILLATION SECTION OCCURS WHEN THE PERCHLOROETHYLENE IS DISTILLED FROM THE HEAVIES AND THE HEAVIES ARE SENT BACK TO THE REACTOR SYSTEM AS DILUENT. THE PRODUCTS CARBON TETRACHLORIDE AND PERCHLOROETHYLENE THEN UNDERGO THE FINAL PHASE OF THE PROCESS WHEN THEY ARE FILTERED IN CAUSTIC FLAKE AND ACTIVATED CARBON FILTERS TO REMOVE WATER AND OTHER REMAINING IMPURITIES. THE FINISHED PRODUCTS ARE THEN SENT TO TANK FARM STORAGE AND USED AS A SALES GRADE PRODUCT TO SUPPLY CUSTOMERS THROUGH OUT THE UNITED STATES.

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DOW CHEMICAL LAD
SOLVENTS / EDC 1

EDC PROCESS DESCRIPTION

IN THE EDC 1 PLANT, ETHYLENE DICHLORIDE IS SYNTHESIZED WHEN AN EXOTHERMIC REACTION OCCURS BETWEEN CHLORINE AND ETHYLENE. THE REACTION IS CONTROLLED IN AN ETHYLENE EXCESS BY A LIQUID BED OF ETHYLENE DICHLORIDE. THE PRODUCT UNDERGOES A HEAVIES REMOVAL PHASE WHILE IN THE REACTOR ITSELF, AND A LIGHTS REMOVAL PHASE IN THE DISTILLATION SECTION OF THE PLANT. THE HEAVIES REMOVED ARE SENT TO THE SOLVENTS PER / TET REACTOR, R-1C, AS A RAW MATERIAL IN THE PRODUCTION OF PERCHLOROETHYLENE AND CARBON TETRACHLORIDE. THE LIGHTS REMOVED ARE SENT TO THE VINYL II OXY REACTOR AND IN TURN ARE USED AS A RAW MATERIAL IN THE PRODUCTION OF ETHYLENE DICHLORIDE. THE FINISHED PRODUCT ETHYLENE DICHLORIDE IS EITHER SENT TO VINYL II AS A RAW MATERIAL FOR VINYL CHLORIDE MONOMER PRODUCTION, OR, IT IS SENT TO TANK FARM STORAGE AND USED AS A SALES GRADE PRODUCT TO SUPPLY CUSTOMERS THROUGH OUT THE UNITED STATES.

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SAMPLING AND ANALYTICAL PARAMETERS

SAMPLING PROCEDURE FOR RCL'S AND HEXES

SAMPLING WAS PERFORMED USING THE ANATOLE J. SIPIN COMPANY PERMISSIBLE PERSONNEL SAMPLING PUMP, MODEL # SP-1. THESE PUMPS WERE CALIBRATED TO 100 CC'S PER MINUTE FLOW USING THE DUPONT CONSTANT FLOW SAMPLER CALIBRATOR GRADUATED BUBBLE CYLINDER. CALIBRATION WAS PERFORMED BEFORE AND AFTER SAMPLES WERE TAKEN TO INSURE ACCURACY.

COLLECTION TUBE HOLDERS WERE CONNECTED TO THE SAMPLER BY A 2' (FOOT) SECTION OF TYGON TUBING. FOR RCL SAMPLING, A 4" (INCH) DUAL SECTION ACTIVATED CHARCOAL GLASS TUBE (SKC, LOT 120, 400 MG FRONT SECTION AND 200 MG BACK SECTION), WAS USED. FOR HEX SAMPLING, A 4" (INCH) DUAL SECTION PORAPACK QS GLASS TUBE (SKC, SPECIAL LOT, 100 MG FRONT SECTION AND 80 MG BACK SECTION), WAS USED.

TO INSURE REPRESENTATIVE SAMPLING, THE EMPLOYEES MONITORED WERE REQUIRED TO WEAR THE TUBE HOLDER ON THE COLLAR OF THEIR SHIRT. THIS ALLOWED THE SAMPLE TO BE TAKEN IN THE ACTUAL "BREATHING ZONE" OF EACH INDIVIDUAL.

SAMPLE PREPARATION

RCL SAMPLES WERE PREPARED BY DRY ICE CHILLING 10 ML'S OF CS2 IN A 25 ML GLASS VIAL, WITH A MININERT VALVED TOP, AND THEN ADDING THE 600 MG OF CHARCOAL FROM THE SAMPLE TUBE. THE SAMPLE WAS THEN ALLOWED TO COME TO ROOM TEMPERATURE AND THEN SHAKEN FOR SEVERAL HOURS TO ALLOW FOR MAXIMUM EXTRACTION. A 1 ML SAMPLE WAS WITHDRAWN AND TRANSFERRED TO A 2 ML SEPTUM TOP VIAL, THEN IT WAS LOADED ONTO AN AUTO INJECT CAROUSEL FOR GAS CHROMATOGRAPH ANALYSIS.

HEX SAMPLES WERE PREPARED BY PLACING THE 180 MG OF PORAPACK PACKING INTO A 25 ML GLASS VIAL, WITH A MININERT VALVED TOP, AND THEN ADDING 10 ML'S OF HEXANE. THE SAMPLE IS THEN SHAKEN FOR SEVERAL HOURS TO ALLOW FOR MAXIMUM EXTRACTION. A 1 MICROLITER SAMPLE WAS WITHDRAWN AND TRANSFERRED TO A 2 ML SEPTUM TOP VIAL, THEN IT WAS LOADED ONTO AN AUTO INJECT CAROUSEL FOR GAS CHROMATOGRAPH ANALYSIS.

ANALYTICAL

RCL ANALYSES WERE DONE USING A HEWLETT PACKARD 5790 A GAS CHROMATOGRAPH EQUIPPED WITH A FLAME IONIZATION DETECTOR. THIS CHROMATOGRAPH WAS INTERFACED TO A HEWLETT-PACKARD MODEL 21 MX COMPUTER WHICH DETERMINED CONCENTRATIONS BASED ON THE INTEGRATED PEAK AREA. INSTRUMENT CONDITIONS WERE AS FOLLOWS :

COLUMN : MODEL # OV 1701, 25 METERS, .32 MILLIMETER I. D., 1 MICRON FILM,
FUSED SILICA.

TEMPERATURE PROGRAM : DETECTOR - 150 DEGREES
(DEGREES CENTIGRADE) INJECTOR - 150 DEGREES
OVEN - 2 MINUTES AT 50 DEGREES
8 MINUTE RAMP UP AT 10 DEGREES A MINUTE TO
130 DEGREES
.5 MINUTES AT 130 DEGREES

ATTENUATION : 1
SAMPLE SIZE : 5 MICROLITERS

CARRIER GAS : HELIUM
INJECTION SPLIT FLOW : 96 CC/MINUTE

ELUTION TIMES : 2.61 CS2
(MINUTES) 3.92 TET
4.58 EDC
5.32 PDC
6.96 PER
7.24 B-TRI

GAS FLOW : HELIUM 3.5 CC/MINUTE (COLUMN)
GAS PRESSURE : HELIUM 10.5 PSI
HYDROGEN 23.0 PSI
AIR 21.0 PSI

HEX ANALYSES WERE DONE USING A HEWLETT-PACKARD MODEL 5790 A GAS
CHROMATOGRAPH EQUIPPED WITH AN ELECTRON CAPTURE DETECTOR. THIS CHROMATOGRAPH
WAS INTERFACED TO A SPECTROPHYSICS MODEL 4100 COMPUTER/INTEGRATOR WHICH
DETERMINED CONCENTRATIONS BASED ON THE INTEGRATED PEAK AREA. INSTRUMENT
CONDITIONS WERE AS FOLLOWS :

COLUMN : MODEL # DB-5, 30 METERS, .32 MILLIMETER I. D., 1 MICRON FILM,
CAPILLARY.

TEMPERATURE PROGRAM : DETECTOR - 200 DEGREES
(DEGREES CENTIGRADE) INJECTOR - 200 DEGREES
OVEN - 4 MINUTES AT 200 DEGREES
8 MINUTE RAMP UP AT 10 DEGREES A MINUTE TO
280 DEGREES
.5 MINUTES AT 280 DEGREES

ATTENUATION : 1
SAMPLE SIZE : 1 MICROLITER

CARRIER GAS : HELIUM
INJECTION SPLIT : 10 TO 1

ELUTION TIMES : 3.00 HCE
(MINUTES) 3.65 HCBF
9.09 HCBZ

GAS FLOWS : HELIUM 1 CC/MINUTE (COLUMN)
NITROGEN 60 CC/MINUTE (MAKEUP)
GAS PRESSURE : HELIUM 50 PSI
NITROGEN 10 PSI

ANALYTICAL EQUATIONS

RCL EQUATION

PPM VOLUME OF RCLS IN AIR =

(WEIGHT OF CS2 IN GRAMS) (.0821) (DEGREES K) (PPM FROM CHROMATOGRAM)

(MW) (L)

WHERE : CS2 = CARBON DISULFIDE USED FOR DESORPTION
.0821 = GAS CONSTANT (CONVERTS GRAMS TO LITERS)
DEGREES K = DEGREES KELVIN (DEGREES CENTIGRADE + 273)
MW = MOLECULAR WEIGHT OF SPECIFIC COMPOUND
L = LITERS OF AIR SAMPLED

HEX EQUATION

PPB VOLUME OF HEXES IN AIR =

(MG) (24.45) (1000)

(L) (MW) (RR)

WHERE : MG = MICROGRAMS FROM INTEGRATOR DATA
24.45 = LITERS OCCUPIED BY 1 MOLE OF GAS AT STANDARD CONDITIONS
L = LITERS OF AIR SAMPLED
MW = MOLECULAR WEIGHT OF SPECIFIC COMPOUND
RR = RECOVERY RATE OF COMPONENT

MB:12/89

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DOW CHEMICAL LAD
INDUSTRIAL HYGIENE SAMPLE CONCENTRATIONS
RCL DATA ENTRY FORM

NAME : MIKE BROWN
PLANT : SOLVENTS / EDC 1
PLANT # : 16 / 17

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SAMPLE DATE (MM/DD/YY) : 06-15-88          TIME START : 9:10 PM
SAMPLE NUMBER           : 05349             TIME STOP  : 10:10 PM
SAMPLE TIME (MIN.)      : 60
SAMPLE VOLUME (L)       : 6.92              PUMP START FLOW : 100 CC/MIN.
SAMPLE TYPE (A, S, P)   : S                 PUMP STOP FLOW  : 100 CC/MIN.
(A=AREA, S=SHORT TERM, P=PERSONNEL)
IF AREA, DESCRIBE      :
RESPIRATOR USED (1 - 7) : 5
8 OR 12 HOUR SHIFT     : 8
SHIFT (DAY,NIGHT, EDO) : D
EMPLOYEE I. D. #       : 438-44-3793
JOB DESCRIPTION         : SHOVELING AND DRUMMING DIRT / SLUDGE FROM V-201
                        : SUMP. WORE PAPER SUIT OVER NOMEX.
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RESPIRATOR TYPES : 1=NONE, 2=MOUThBIT, 3=COMFO II, 4=FULL FACE,
5=BREATHING AIR, 6=DUST MASK, 7=SCBA.

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ANALYTICAL RESULTS

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	DOW	EXPOSURE	LABORATORY	MONITORING
	REGISTRY	GUIDELINES	ANALYSIS	RESULT
COMPOUND	NUMBER	PEL : STEL	LOO : RESULT	8 HR TWA : AREA
TET	: 0002-3654	: 5 :	: 0.004 : 141.80	: 41.93 :
EDC	: 0001-8531	: 10 :	: 0.003 : 4.00	: 1.84 :
PDC	: 0001-9943	: 75 : 110	: 0.003 : 14.66	: 5.90 :
PER	: 0002-3698	: 50 : 200	: 0.004 : 44.65	: 12.25 :
B-TRI	: 0002-3687	: 10 :	: 0.003 : 0.003	: < 0.01 :

NOTE : ALL DATA IN PPM.

RCL EQUATION : PPM VOLUME OF RCLS IN AIR =

(WEIGHT OF CS2 IN GRAMS) (.0821) (DEGREES K) (PPM FROM CHROMATOGRAM)

(MW) (L)

WHERE : CS2 = CARBON DISULFIDE USED FOR DESORPTION
.0821 = GAS CONSTANT (CONVERTS GRAMS TO LITERS)
DEGREES K = DEGREES KELVIN (DEGREES CENTIGRADE + 273)
MW = MOLECULAR WEIGHT OF SPECIFIC COMPOUND
L = LITERS OF AIR SAMPLED

DO 078731
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Directory DU0:[5,160]
4-AUG-90 11:13

IHRCL.88;129 164	7.	12-JUL-90 18:16
IHRCL.88;130 165	7.	12-JUL-90 18:19
IHRCL.88;131 166	7.	04-AUG-90 08:13
IHRCL.88;132 167	7.	04-AUG-90 08:19
IHRCL.88;133 168	7.	04-AUG-90 08:23
IHRCL.88;135 169	7.	04-AUG-90 08:27
IHRCL.88;136 170	7.	04-AUG-90 08:33
IHRCL.88;137 171 -	7.	04-AUG-90 09:01
IHRCL.88;138 172 -	7.	04-AUG-90 09:04
IHRCL.88;139 173	7.	04-AUG-90 09:07
IHRCL.88;140 174	7.	04-AUG-90 09:14
IHRCL.88;141 175	7.	04-AUG-90 09:17
IHRCL.88;142 176	7.	04-AUG-90 09:20
IHRCL.88;143 177	7.	04-AUG-90 09:23
IHRCL.88;144	7.	04-AUG-90 09:26
IHRCL.88;145	7.	04-AUG-90 09:29
IHRCL.88;146	7.	04-AUG-90 09:31
IHRCL.88;147	7.	04-AUG-90 09:33
IHRCL.88;148	7.	04-AUG-90 09:35
IHRCL.88;149	7.	04-AUG-90 09:38
IHRCL.88;150	7.	04-AUG-90 09:40
IHRCL.88;151	7.	04-AUG-90 10:28
IHRCL.88;152	7.	04-AUG-90 10:31
IHRCL.88;153	7.	04-AUG-90 10:39
IHRCL.88;154	7.	04-AUG-90 10:42
IHRCL.88;155	7.	04-AUG-90 10:44
IHRCL.88;156	7.	04-AUG-90 10:46
IHRCL.88;157	7.	04-AUG-90 10:48
IHRCL.88;158	7.	04-AUG-90 10:50
IHRCL.88;159	7.	04-AUG-90 10:53
IHRCL.88;160	7.	04-AUG-90 10:55
IHRCL.88;161	7.	04-AUG-90 10:57

Total of 224./224. blocks in 32. files

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DO 078732
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Directory DU0:[5,160]
4-AUG-90 12:58

IHHEX.88;28	6.	04-AUG-90 12:25
IHHEX.88;29	6.	04-AUG-90 12:31
IHHEX.88;30	6.	04-AUG-90 12:34
IHHEX.88;31	6.	04-AUG-90 12:36
IHHEX.88;32	6.	04-AUG-90 12:40
IHHEX.88;33	6.	04-AUG-90 12:42
IHHEX.88;34	6.	04-AUG-90 12:44
IHHEX.88;35	6.	04-AUG-90 12:46
IHHEX.88;36	6.	04-AUG-90 12:48
IHHEX.88;37	6.	04-AUG-90 12:51

Total of 60./60. blocks in 10. files

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DOW CHEMICAL LAB
INDUSTRIAL HYGIENE SAMPLE CONCENTRATIONS
RCL DATA ENTRY FORM

NAME : MIKE BROWN
PLANT : SOLVENTS / EDC 1
PLANT # : 16 / 17

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SAMPLE DATE (MM/DD/YY) : 06-15-88	TIME START : 9:10 PM
SAMPLE NUMBER : 05349	TIME STOP : 10:10 PM
SAMPLE TIME (MIN.) : 60	
SAMPLE VOLUME (L) : 6.92	PUMP START FLOW : 100 CC/MIN.
SAMPLE TYPE (A, S, P) : S	PUMP STOP FLOW : 100 CC/MIN.

(A=AREA, S=SHORT TERM, P=PERSONNEL)

IF AREA, DESCRIBE :
RESPIRATOR USED (1 - 7) : 5
8 OR 12 HOUR SHIFT : 8
SHIFT (DAY, NIGHT, EDO) : D
EMPLOYEE I. D. # : 438-44-3793
JOB DESCRIPTION : SHOVELING AND DROMMING DIRT / SLUDGE FROM V-201
SUMP. WORE PAPER SUIT OVER NOMEX.

RESPIRATOR TYPES : 1=NONE, 2=MOUTHPIECE, 3=COMFO II, 4=FULL FACE,
5=BREATHING AIR, 6=DUST MASK, 7=SCBA.

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ANALYTICAL RESULTS

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COMPOUND	DR #	STEL	LOQ	ANALYSIS	RESULT	8 HOUR TWA	AREA
TET	0002-3654	5 : (0.5)	0.004	141.80	41.93		
EDC	0001-8531	10 : (0)	0.003	4.00	1.84		
PDC	0001-9943	75 : 110	0.003	14.66	5.90		
PER	0002-3698	50 : 200	0.004	44.65	12.25		
B-TRI	0002-3687	10 : (0)	0.003	0.003	< 0.01		

=====

NOTE : ALL RESULTS IN PPM UNLESS OTHERWISE NOTED.

RCL EQUATION : PPM VOLUME OF RCLS IN AIR =

(WEIGHT OF CS2 IN GRAMS) (.0821) (DEGREES K) (PPM FROM CHROMATOGRAM)

(MW) (L)

WHERE : CS2 = CARBON DISULFIDE USED FOR DESORPTION
.0821 = GAS CONSTANT (CONVERTS GRAMS TO LITERS)
DEGREES K = DEGREES KELVIN (DEGREES CENTIGRADE + 273)
MW = MOLECULAR WEIGHT OF SPECIFIC COMPOUND
L = LITERS OF AIR SAMPLED

DOW CHEMICAL LAD
INDUSTRIAL HYGIENE SAMPLE CONCENTRATIONS
RCL DATA ENTRY FORM

NAME : MIKE BROWN
PLANT : SOLVENTS / EDC 1
PLANT # : 16 / 17

=====

SAMPLE DATE (MM/DD/YY)	: 06-15-88	TIME START	: 9:10 PM
SAMPLE NUMBER	: 05350	TIME STOP	: 10:10 PM
SAMPLE TIME (MIN.)	: 60		
SAMPLE VOLUME (L)	: 7.20	PUMP START FLOW	: 100 CC/MIN.
SAMPLE TYPE (A, S, P)	: S	PUMP STOP FLOW	: 100 CC/MIN.

(A=AREA, S=SHORT TERM, P=PERSONNEL)
IF AREA, DESCRIBE :
RESPIRATOR USED (1 - 7) : 5
8 OR 12 HOUR SHIFT : 8
SHIFT (DAY, NIGHT, EDO) : D
EMPLOYEE I. D. # : 439-54-8708
JOB DESCRIPTION : SHOVELING AND DRUMMING DIRT / SLUDGE FROM V-201
SUMP. WORE PAPER SUIT OVER NOMEX.

RESPIRATOR TYPES : 1=NONE, 2=MOUHTBIT, 3=COMFO II, 4=FULL FACE,
5=BREATHING AIR, 6=DUST MASK, 7=SCBA.

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ANALYTICAL RESULTS

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COMPOUND	DR #	ANALYSIS	RESULT	8 HOUR TWA	AREA
TET	: 0002-3654	: 5 : (0) : 0.004	: 85.21	: 24.20	:
EDC	: 0001-8531	: 10 : (0) : 0.003	: 2.60	: 1.15	:
PDC	: 0001-9943	: 75 : 110 : 0.003	: 8.66	: 3.35	:
PER	: 0002-3698	: 50 : 200 : 0.004	: 23.85	: 6.28	:
B-TRI	: 0002-3687	: 10 : (0) : 0.003	: 0.003	: < 0.01	:

NOTE : ALL RESULTS IN PPM UNLESS OTHERWISE NOTED.

RCL EQUATION : PPM VOLUME OF RCLS IN AIR =

(WEIGHT OF CS2 IN GRAMS) (.0821) (DEGREES K) (PPM FROM CHROMATOGRAM)

(MW) (L)

WHERE : CS2 = CARBON DISULFIDE USED FOR DESORPTION
.0821 = GAS CONSTANT (CONVERTS GRAMS TO LITERS)
DEGREES K = DEGREES KELVIN (DEGREES CENTIGRADE + 273)
MW = MOLECULAR WEIGHT OF SPECIFIC COMPOUND
L = LITERS OF AIR SAMPLED

MB:12/89

DO 078735
CONFIDENTIAL

DOW CHEMICAL LAD
INDUSTRIAL HYGIENE SAMPLE CONCENTRATIONS
RCL DATA ENTRY FORM

NAME : MIKE BROWN
PLANT : SOLVENTS / EDC 1
PLANT # : 16 / 17

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SAMPLE DATE (MM/DD/YY) : 07-11-88	TIME START : 9:37 AM
SAMPLE NUMBER : 05356	TIME STOP : 11:27 AM
SAMPLE TIME (MIN.) : 110	
SAMPLE VOLUME (L) : 10.87	PUMP START FLOW : 100 CC/MIN.
SAMPLE TYPE (A, S, P) : S	PUMP STOP FLOW : 100 CC/MIN.

(A=AREA, S=SHORT TERM, P=PERSONNEL)
IF AREA, DESCRIBE :
RESPIRATOR USED (1 - 7) : 4
8 OR 12 HOUR SHIFT : 8
SHIFT (DAY, NIGHT, EDO) : D
EMPLOYEE I. D. # : 435-60-4941
JOB DESCRIPTION : REMOVING SECTION OF R-1C OH LINE.

RESPIRATOR TYPES : 1=NONE, 2=MOUTHBIT, 3=COMFO II, 4=FULL FACE,
5=BREATHING AIR, 6=DUST MASK, 7=SCBA.

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ANALYTICAL RESULTS

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COMPOUND :	DR # :	TLV :	STEL :	LOQ :	ANALYSIS :	8 HOUR TWA:	AREA :
TET	: 0002-3654	: 5	: 0	: 0.004	: 0.28	: 0.05	:
EDC	: 0001-8531	: 10	: 0	: 0.003	: 0.003	: < 0.01	:
PDC	: 0001-9943	: 75	: 110	: 0.003	: 0.06	: 0.02	:
PER	: 0002-3698	: 50	: 200	: 0.004	: 0.20	: 0.04	:
B-TRI	: 0002-3687	: 10	: 0	: 0.003	: 0.003	: < 0.01	:

NOTE : ALL RESULTS IN PPM UNLESS OTHERWISE NOTED.

RCL EQUATION : PPM VOLUME OF RCLS IN AIR =

(WEIGHT OF CS2 IN GRAMS) (.0821) (DEGREES K) (PPM FROM CHROMATOGRAM)

(MW) (L)

WHERE : CS2 = CARBON DISULFIDE USED FOR DESORPTION
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 DEGREES K = DEGREES KELVIN (DEGREES CENTIGRADE + 273)
 MW = MOLECULAR WEIGHT OF SPECIFIC COMPOUND
 L = LITERS OF AIR SAMPLED

DOW CHEMICAL LAD
INDUSTRIAL HYGIENE SAMPLE CONCENTRATIONS
RCL DATA ENTRY FORM

NAME : MIKE BROWN
PLANT : SOLVENTS / EDC 1
PLANT # : 16 / 17

=====

SAMPLE DATE (MM/DD/YY) :	07-11-88	TIME START :	9:37 AM
SAMPLE NUMBER :	05358	TIME STOP :	11:27 AM
SAMPLE TIME (MIN.) :	110		
SAMPLE VOLUME (L) :	9.73	PUMP START FLOW :	100 CC/MIN.
SAMPLE TYPE (A, S, P) :	S	PUMP STOP FLOW :	100 CC/MIN.

(A=AREA, S=SHORT TERM, P=PERSONNEL)
IF AREA, DESCRIBE :
RESPIRATOR USED (1 - 7) : 4
8 OR 12 HOUR SHIFT : 8
SHIFT (DAY, NIGHT, EDO) : D
EMPLOYEE I. D. # : 438-52-6268
JOB DESCRIPTION : REMOVING SECTION OF R-1C OH LINE.

RESPIRATOR TYPES : 1=NONE, 2=MOUThBIT, 3=COMFO II, 4=FULL FACE,
5=BREATHING AIR, 6=DUST MASK, 7=SCBA.

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ANALYTICAL RESULTS

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COMPOUND :	DR # :	EXPOSURE TLV GUIDE LINE mg : STEL :	LOG :	ANALYSIS :	RESULT :	8 HOUR TWA :	AREA :
TET	: 0002-3654 :	5 :	0	: 0.004 :	0.19	: 0.04	:
EDC	: 0001-8531 :	10 :	0	: 0.003 :	0.003	: < 0.01	:
PDC	: 0001-9943 :	75 :	110	: 0.003 :	0.06	: 0.02	:
PER	: 0002-3698 :	50 :	200	: 0.004 :	0.06	: 0.01	:
B-TRI	: 0002-3687 :	10 :	0	: 0.003 :	0.003	: < 0.01	:

NOTE : ALL RESULTS IN PPM UNLESS OTHERWISE NOTED.

RCL EQUATION : PPM VOLUME OF RCLS IN AIR =

(WEIGHT OF CS2 IN GRAMS) (.0821) (DEGREES K) (PPM FROM CHROMATOGRAM)

(MW) (L)

WHERE : CS2 = CARBON DISULFIDE USED FOR DESORPTION
.0821 = GAS CONSTANT (CONVERTS GRAMS TO LITERS)
DEGREES K = DEGREES KELVIN (DEGREES CENTIGRADE + 273)
MW = MOLECULAR WEIGHT OF SPECIFIC COMPOUND
L = LITERS OF AIR SAMPLED

DOW CHEMICAL LAD
INDUSTRIAL HYGIENE SAMPLE CONCENTRATIONS
RCL DATA ENTRY FORM

NAME : MIKE BROWN
PLANT : SOLVENTS / EDC 1
PLANT # : 16 / 17

=====

SAMPLE DATE (MM/DD/YY)	: 08-25-88	TIME START	: 9:30 AM
SAMPLE NUMBER	: 05374	TIME STOP	: 2:00 PM
SAMPLE TIME (MIN.)	: 270		
SAMPLE VOLUME (L)	: 27.46	PUMP START FLOW	: 100 CC/MIN.
SAMPLE TYPE (A, S, P)	: S	PUMP STOP FLOW	: 100 CC/MIN.
(A=AREA, S=SHORT TERM, P=PERSONNEL)			
IF AREA, DESCRIBE	:		
RESPIRATOR USED (1 - 7)	: 3		
8 OR 12 HOUR SHIFT	: 8		
SHIFT (DAY, NIGHT, EDO)	: D		
EMPLOYEE I. D. #	: 433-52-7995		
JOB DESCRIPTION	: LOADING DIRT INTO DRUMS FROM T/C RACK EXCAVATION.		
	INCLUDES 30 MIN. LUNCH.		
RESPIRATOR TYPES	: 1=NONE, 2=MOUTHBIT, 3=COMFO II, 4=FULL FACE,		
	5=BREATHING AIR, 6=DUST MASK, 7=SCBA.		

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ANALYTICAL RESULTS

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COMPOUND	DR #	EXPOSURE : TLV GUIDELINE : 148	STEL	LOQ	ANALYSIS : RESULT	8 HOUR TWA	AREA
TET	: 0002-3654	: 5	: (0)	: 0.004	: 0.21	: 0.02	:
EDC	: 0001-8531	: 10	: (0)	: 0.003	: 0.003	: < 0.01	:
PDC	: 0001-9943	: 75	: 110	: 0.003	: 0.07	: 0.01	:
PER	: 0002-3698	: 50	: 200	: 0.004	: 0.20	: 0.01	:
B-TRI	: 0002-3687	: 10	: (0)	: 0.003	: 0.003	: < 0.01	:

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NOTE : ALL RESULTS IN PPM UNLESS OTHERWISE NOTED.

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RCL EQUATION : PPM VOLUME OF RCLS IN AIR =

(WEIGHT OF CS2 IN GRAMS) (.0821) (DEGREES K) (PPM FROM CHROMATOGRAM)

(MW) (L)

WHERE : CS2 = CARBON DISULFIDE USED FOR DESORPTION
.0821 = GAS CONSTANT (CONVERTS GRAMS TO LITERS)
DEGREES K = DEGREES KELVIN (DEGREES CENTIGRADE + 273)
MW = MOLECULAR WEIGHT OF SPECIFIC COMPOUND
L = LITERS OF AIR SAMPLED

DOW CHEMICAL LAD
INDUSTRIAL HYGIENE SAMPLE CONCENTRATIONS
RCL DATA ENTRY FORM

NAME : MIKE BROWN
PLANT : SOLVENTS / EDC 1
PLANT # : 16 / 17

=====

SAMPLE DATE (MM/DD/YY) : 08-25-88	TIME START : 9:30 AM
SAMPLE NUMBER : 05375	TIME STOP : 2:00 PM
SAMPLE TIME (MIN.) : 270	
SAMPLE VOLUME (L) : 27.88	PUMP START FLOW : 100 CC/MIN.
SAMPLE TYPE (A, S, P) : A	PUMP STOP FLOW : 100 CC/MIN.

(A=AREA, S=SHORT TERM, P=PERSONNEL)
IF AREA, DESCRIBE : T/C RACK DURING EXCAVATION OF DIRT.
RESPIRATOR USED (1 - 7) :
8 OR 12 HOUR SHIFT :
SHIFT (DAY,NIGHT, EDO) :
EMPLOYEE I. D. # :
JOB DESCRIPTION :

RESPIRATOR TYPES : 1=NONE, 2=MOUTHBIT, 3=COMFO II, 4=FULL FACE,
5=BREATHING AIR, 6=DUST MASK, 7=SCBA.

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ANALYTICAL RESULTS

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COMPOUND :	DR # :	ANALYSIS :	RESULT :	8 HOUR TWA:	AREA :
TET : 0002-3654 :	5 :	0.004 :	0.27 :	0.02 :	
EDC : 0001-8531 :	10 :	0.003 :	0.003 :	< 0.01 :	
PDC : 0001-9943 :	75 :	0.003 :	0.09 :	0.01 :	
PER : 0002-3698 :	50 :	0.004 :	0.57 :	0.04 :	
B-TRI : 0002-3687 :	10 :	0.003 :	0.08 :	0.01 :	

NOTE : ALL RESULTS IN PPM UNLESS OTHERWISE NOTED.

RCL EQUATION : PPM VOLUME OF RCLS IN AIR =

(WEIGHT OF CS2 IN GRAMS) (.0821) (DEGREES K) (PPM FROM CHROMATOGRAM)

(MW) (L)

WHERE : CS2 = CARBON DISULFIDE USED FOR DESORPTION
 .0821 = GAS CONSTANT (CONVERTS GRAMS TO LITERS)
 DEGREES K = DEGREES KELVIN (DEGREES CENTIGRADE + 273)
 MW = MOLECULAR WEIGHT OF SPECIFIC COMPOUND
 L = LITERS OF AIR SAMPLED

MB:12/89

DO 078739
CONFIDENTIAL

DOW CHEMICAL LAD
INDUSTRIAL HYGIENE SAMPLE CONCENTRATIONS
RCL DATA ENTRY FORM

NAME : MIKE BROWN
PLANT : SOLVENTS / EDC 1
PLANT # : 16 / 17

=====

SAMPLE DATE (MM/DD/YY) :	09-01-88	TIME START :	6:30 AM
SAMPLE NUMBER :	05376	TIME STOP :	10:30 AM
SAMPLE TIME (MIN.) :	240		
SAMPLE VOLUME (L) :	25.86	PUMP START FLOW :	100 CC/MIN.
SAMPLE TYPE (A, S, P) :	A	PUMP STOP FLOW :	100 CC/MIN.

(A=AREA, S=SHORT TERM, P=PERSONNEL)
IF AREA, DESCRIBE : C-2 / C-5B AREA DURING SHUTDOWN / CLEARING.
RESPIRATOR USED (1 - 7) :
8 OR 12 HOUR SHIFT :
SHIFT (DAY, NIGHT, EDO) :
EMPLOYEE I. D. # :
JOB DESCRIPTION :

RESPIRATOR TYPES : 1=NONE, 2=MOUTHBIT, 3=COMFO II, 4=FULL FACE,
5=BREATHING AIR, 6=DUST MASK, 7=SCBA.

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ANALYTICAL RESULTS

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COMPOUND :	DR # :	TEL :	STEL :	LOG :	ANALYSIS :	8 HOUR TWA:	AREA :
TET	: 0002-3654 :	5 :	0 :	0.004 :	0.21 :	0.02 :	
EDC	: 0001-8531 :	10 :	0 :	0.003 :	0.05 :	0.01 :	
PDC	: 0001-9943 :	75 :	110 :	0.003 :	0.06 :	0.01 :	
PER	: 0002-3698 :	50 :	200 :	0.004 :	0.06 :	< 0.01 :	
B-TRI	: 0002-3687 :	10 :	0 :	0.003 :	0.003 :	< 0.01 :	

NOTE : ALL RESULTS IN PPM UNLESS OTHERWISE NOTED.

RCL EQUATION : PPM VOLUME OF RCLS IN AIR =

(WEIGHT OF CS2 IN GRAMS) (.0821) (DEGREES K) (PPM FROM CHROMATOGRAM)

(MW) (L)

WHERE : CS2 = CARBON DISULFIDE USED FOR DESORPTION
.0821 = GAS CONSTANT (CONVERTS GRAMS TO LITERS)
DEGREES K = DEGREES KELVIN (DEGREES CENTIGRADE + 273)
MW = MOLECULAR WEIGHT OF SPECIFIC COMPOUND
L = LITERS OF AIR SAMPLED

MB:12/89

DO 078740
CONFIDENTIAL

DOW CHEMICAL LAB
INDUSTRIAL HYGIENE SAMPLE CONCENTRATIONS
RCL DATA ENTRY FORM

NAME : MIKE BROWN
PLANT : SOLVENTS / EDC 1
PLANT # : 16 / 17

=====

SAMPLE DATE (MM/DD/YY) :	09-01-88	TIME START :	6:30 AM
SAMPLE NUMBER :	05386	TIME STOP :	10:30 AM
SAMPLE TIME (MIN.) :	240		
SAMPLE VOLUME (L) :	25.66	PUMP START FLOW :	100 CC/MIN.
SAMPLE TYPE (A, S, P) :	A	PUMP STOP FLOW :	100 CC/MIN.

(A=AREA, S=SHORT TERM, P=PERSONNEL)
IF AREA, DESCRIBE : C-2 / C-5B AREA DURING SHUTDOWN / CLEARING.
RESPIRATOR USED (1 - 7) :
8 OR 12 HOUR SHIFT :
SHIFT (DAY,NIGHT, EDO) :
EMPLOYEE I. D. # :
JOB DESCRIPTION :

RESPIRATOR TYPES : 1=NONE, 2=MOUThBIT, 3=COMFO II, 4=FULL FACE,
5=BREATHING AIR, 6=DUST MASK, 7=SCBA.

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ANALYTICAL RESULTS

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COMPOUND :	DR # :	IN :	STEL :	LOQ :	ANALYSIS :	RESULT :	8 HOUR TWA:	AREA :
TET	0002-3654	5	0	0.004	0.58		0.05	
EDC	0001-8531	10	0	0.003	0.05		0.01	
PDC	0001-9943	75	110	0.003	0.05		0.01	
PER	0002-3698	50	200	0.004	0.06		0.01	
B-TRI	0002-3687	10	0	0.003	0.003		< 0.01	

NOTE : ALL RESULTS IN PPM UNLESS OTHERWISE NOTED.

RCL EQUATION : PPM VOLUME OF RCLS IN AIR =

(WEIGHT OF CS2 IN GRAMS) (.0821) (DEGREES K) (PPM FROM CHROMATOGRAM)

(MW) (L)

WHERE : CS2 = CARBON DISULFIDE USED FOR DESORPTION
.0821 = GAS CONSTANT (CONVERTS GRAMS TO LITERS)
DEGREES K = DEGREES KELVIN (DEGREES CENTIGRADE + 273)
MW = MOLECULAR WEIGHT OF SPECIFIC COMPOUND
L = LITERS OF AIR SAMPLED

MB: 12/89

DO 078741
CONFIDENTIAL

DOW CHEMICAL LAD
INDUSTRIAL HYGIENE SAMPLE CONCENTRATIONS
RCL DATA ENTRY FORM

NAME : MIKE BROWN
PLANT : SOLVENTS / EDC 1
PLANT # : 16 / 17

=====

SAMPLE DATE (MM/DD/YY) :	09-28-88	TIME START :	7:45 AM
SAMPLE NUMBER :	05387	TIME STOP :	12:00 PM
SAMPLE TIME (MIN.) :	255		
SAMPLE VOLUME (L) :	27.67	PUMP START FLOW :	100 CC/MIN.
SAMPLE TYPE (A, S, P) :	A	PUMP STOP FLOW :	100 CC/MIN.

(A=AREA, S=SHORT TERM, P=PERSONNEL)
IF AREA, DESCRIBE : DUMPING V-201 TO SUMP.
RESPIRATOR USED (1 - 7) :
8 OR 12 HOUR SHIFT :
SHIFT (DAY, NIGHT, EDO) :
EMPLOYEE I. D. # :
JOB DESCRIPTION :

RESPIRATOR TYPES : 1=NONE, 2=MOUThBIT, 3=COMFO II, 4=FULL FACE,
5=BREATHING AIR, 6=DUST MASK, 7=SCBA.

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ANALYTICAL RESULTS

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COMPOUND :	DR # :	STEL :	LOQ :	ANALYSIS :	RESULT :	8 HOUR TWA:	AREA :
TET	: 0002-3654 :	5 :	0.004 :	2.47 :		0.18 :	
EDC	: 0001-8531 :	10 :	0.003 :	0.14 :		0.02 :	
PDC	: 0001-9943 :	75 :	110 :	0.003 :	0.47 :	0.05 :	
PER	: 0002-3698 :	50 :	200 :	0.004 :	0.67 :	0.05 :	
B-TRI	: 0002-3687 :	10 :	0.003 :	0.003 :		< 0.01 :	

NOTE : ALL RESULTS IN PPM UNLESS OTHERWISE NOTED.

RCL EQUATION : PPM VOLUME OF RCLS IN AIR =

(WEIGHT OF CS2 IN GRAMS) (.0821) (DEGREES K) (PPM FROM CHROMATOGRAM)

(MW) (L)

WHERE : CS2 = CARBON DISULFIDE USED FOR DESORPTION
.0821 = GAS CONSTANT (CONVERTS GRAMS TO LITERS)
DEGREES K = DEGREES KELVIN (DEGREES CENTIGRADE + 273)
MW = MOLECULAR WEIGHT OF SPECIFIC COMPOUND
L = LITERS OF AIR SAMPLED

MB:12/89

DO 078742
CONFIDENTIAL

DOW CHEMICAL LAD
INDUSTRIAL HYGIENE SAMPLE CONCENTRATIONS
RCL DATA ENTRY FORM

NAME : MIKE BROWN
PLANT : SOLVENTS / EDC 1
PLANT # : 16 / 17

=====

SAMPLE DATE (MM/DD/YY) :	09-28-88	TIME START :	7:45 AM
SAMPLE NUMBER :	05388	TIME STOP :	12:00 PM
SAMPLE TIME (MIN.) :	255		
SAMPLE VOLUME (L) :	28.92	PUMP START FLOW :	100 CC/MIN.
SAMPLE TYPE (A, S, P) :	A	PUMP STOP FLOW :	100 CC/MIN.

(A=AREA, S=SHORT TERM, P=PERSONNEL)
IF AREA, DESCRIBE : DUMPING V-201 TO SUMP.
RESPIRATOR USED (1 - 7) :
8 OR 12 HOUR SHIFT :
SHIFT (DAY, NIGHT, EDO) :
EMPLOYEE I. D. # :
JOB DESCRIPTION :

RESPIRATOR TYPES : 1=NONE, 2=MOUTHBIT, 3=COMFO II, 4=FULL FACE,
5=BREATHING AIR, 6=DUST MASK, 7=SCBA.

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ANALYTICAL RESULTS

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COMPOUND :	DR # :	TV :	STEL :	LOQ :	ANALYSIS :	8 HOUR TWA:	AREA :
TET	: 0002-3654 :	5 :	(0) :	0.004 :	0.79 :	:	0.06 :
EDC	: 0001-8531 :	10 :	(0) :	0.003 :	0.08 :	:	0.01 :
PDC	: 0001-9943 :	75 :	110 :	0.003 :	0.20 :	:	0.02 :
PER	: 0002-3698 :	50 :	200 :	0.004 :	0.22 :	:	0.02 :
B-TRI	: 0002-3687 :	10 :	(0) :	0.003 :	0.003 :	:	< 0.01 :

NOTE : ALL RESULTS IN PPM UNLESS OTHERWISE NOTED.

RCL EQUATION : PPM VOLUME OF RCLS IN AIR =

(WEIGHT OF CS2 IN GRAMS) (.0821) (DEGREES K) (PPM FROM CHROMATOGRAM)

(MW) (L)

WHERE : CS2 = CARBON DISULFIDE USED FOR DESORPTION
.0821 = GAS CONSTANT (CONVERTS GRAMS TO LITERS)
DEGREES K = DEGREES KELVIN (DEGREES CENTIGRADE + 273)
MW = MOLECULAR WEIGHT OF SPECIFIC COMPOUND
L = LITERS OF AIR SAMPLED

MB:12/89

DO 078743
CONFIDENTIAL

DOW CHEMICAL LAD
INDUSTRIAL HYGIENE SAMPLE CONCENTRATIONS
RCL DATA ENTRY FORM

NAME : MIKE BROWN
PLANT : SOLVENTS / EDC 1
PLANT # : 16 / 17

=====

SAMPLE DATE (MM/DD/YY) :	12-20-88	TIME START :	6:30 AM
SAMPLE NUMBER :	09067	TIME STOP :	8:05 AM
SAMPLE TIME (MIN.) :	95		
SAMPLE VOLUME (L) :	9.45	PUMP START FLOW :	100 CC/MIN.
SAMPLE TYPE (A, S, P) :	S	PUMP STOP FLOW :	100 CC/MIN.

(A=AREA, S=SHORT TERM, P=PERSONNEL)
IF AREA, DESCRIBE :
RESPIRATOR USED (1 - 7) : 1
8 OR 12 HOUR SHIFT : 12
SHIFT (DAY, NIGHT, EDO) : D
EMPLOYEE I. D. # : 432722
JOB DESCRIPTION : OUTSIDE ROUND ON THERMAL OXIDIZER.

RESPIRATOR TYPES : 1=NONE, 2=MOUThBIT, 3=COMFO II, 4=FULL FACE,
5=BREATHING AIR, 6=DUST MASK, 7=SCBA.

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ANALYTICAL RESULTS

=====

COMPOUND :	DR # :	TLV :	STEL :	LOQ :	ANALYSIS :	8 HOUR TWA:	AREA :
TET	: 0002-3654 :	5 :	(0) :	0.004 :	0.18 :	0.04 :	:
EDC	: 0001-8531 :	10 :	(0) :	0.003 :	0.003 :	< 0.01 :	:
PDC	: 0001-9943 :	75 :	110 :	0.003 :	0.06 :	0.02 :	:
PER	: 0002-3698 :	50 :	200 :	0.004 :	0.20 :	0.04 :	:
B-TRI	: 0002-3687 :	10 :	(0) :	0.003 :	0.003 :	< 0.01 :	:

NOTE : ALL RESULTS IN PPM UNLESS OTHERWISE NOTED.

RCL EQUATION : PPM VOLUME OF RCLS IN AIR =

(WEIGHT OF CS2 IN GRAMS) (.0821) (DEGREES K) (PPM FROM CHROMATOGRAM)

(MW) (L)

WHERE : CS2 = CARBON DISULFIDE USED FOR DESORPTION
.0821 = GAS CONSTANT (CONVERTS GRAMS TO LITERS)
DEGREES K = DEGREES KELVIN (DEGREES CENTIGRADE + 273)
MW = MOLECULAR WEIGHT OF SPECIFIC COMPOUND
L = LITERS OF AIR SAMPLED

DOW CHEMICAL LAD
INDUSTRIAL HYGIENE SAMPLE CONCENTRATIONS
RCL DATA ENTRY FORM

NAME : MIKE BROWN
PLANT : SOLVENTS / EDC 1
PLANT # : 16 / 17

=====

SAMPLE DATE (MM/DD/YY) :	12-20-88	TIME START :	5:45 AM
SAMPLE NUMBER :	09068	TIME STOP :	9:45 AM
SAMPLE TIME (MIN.) :	240		
SAMPLE VOLUME (L) :	25.50	PUMP START FLOW :	100 CC/MIN.
SAMPLE TYPE (A, S, P) :	S	PUMP STOP FLOW :	100 CC/MIN.

(A=AREA, S=SHORT TERM, P=PERSONNEL)

IF AREA, DESCRIBE :

RESPIRATOR USED (1 - 7) : 1

8 OR 12 HOUR SHIFT : 12

SHIFT (DAY, NIGHT, EDO) : D

EMPLOYEE I. D. # : 432873

JOB DESCRIPTION : P/T MOD V BOARDMAN. INCLUDES SEVERAL TRIPS INTO PLANT AREA.

RESPIRATOR TYPES : 1=NONE, 2=MOUTHBIT, 3=COMFO II, 4=FULL FACE,
5=BREATHING AIR, 6=DUST MASK, 7=SCBA.

=====

ANALYTICAL RESULTS

=====

COMPOUND :	DR # :	STEL :	LOQ :	ANALYSIS :	RESULT :	8 HOUR TWA :	AREA :
TET	: 0002-3654	: 5 : (0)	: 0.004	: 0.19	: 0.02	:	:
EDC	: 0001-8531	: 10 : (0)	: 0.003	: 0.03	: < 0.01	:	:
PDC	: 0001-9943	: 75 : 110	: 0.003	: 0.06	: 0.01	:	:
PER	: 0002-3698	: 50 : 200	: 0.004	: 0.06	: < 0.01	:	:
B-TRI	: 0002-3687	: 10 : (0)	: 0.003	: 0.003	: < 0.01	:	:

NOTE : ALL RESULTS IN PPM UNLESS OTHERWISE NOTED.

RCL EQUATION : PPM VOLUME OF RCLS IN AIR =

(WEIGHT OF CS2 IN GRAMS) (.0821) (DEGREES K) (PPM FROM CHROMATOGRAM)

(MW) (L)

WHERE : CS2 = CARBON DISULFIDE USED FOR DESORPTION
.0821 = GAS CONSTANT (CONVERTS GRAMS TO LITERS)
DEGREES K = DEGREES KELVIN (DEGREES CENTIGRADE + 273)
MW = MOLECULAR WEIGHT OF SPECIFIC COMPOUND
L = LITERS OF AIR SAMPLED

MB:12/89

DO 078745
CONFIDENTIAL

DOW CHEMICAL LAD
INDUSTRIAL HYGIENE SAMPLE CONCENTRATIONS
RCL DATA ENTRY FORM

NAME : MIKE BROWN
PLANT : SOLVENTS / EDC 1
PLANT # : 16 / 17

=====

SAMPLE DATE (MM/DD/YY) : 12-20-88	TIME START : 5:45 AM
SAMPLE NUMBER : 09069	TIME STOP : 7:40 AM
SAMPLE TIME (MIN.) : 115	
SAMPLE VOLUME (L) : 11.47	PUMP START FLOW : 100 CC/MIN.
SAMPLE TYPE (A, S, P) : S	PUMP STOP FLOW : 100 CC/MIN.

(A=AREA, S=SHORT TERM, P=PERSONNEL)

IF AREA, DESCRIBE :
RESPIRATOR USED (1 - 7) : 1
8 OR 12 HOUR SHIFT : 12
SHIFT (DAY, NIGHT, EDO) : D
EMPLOYEE I. D. # : 432627
JOB DESCRIPTION : P/T BOARDMAN. INCLUDES TWO TRIPS INTO PLANT AREA.

RESPIRATOR TYPES : 1=NONE, 2=MOUTHBIT, 3=COMFO II, 4=FULL FACE,
5=BREATHING AIR, 6=DUST MASK, 7=SCBA.

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ANALYTICAL RESULTS

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COMPOUND :	DR # :	<i>Exposure Guideline</i> TLV : THG :	STEL :	LOQ :	ANALYSIS : RESULT :	8 HOUR TWA :	AREA :
TET	: 0002-3654	: 5	: (0)	: 0.004	: 0.19	: 0.03	:
EDC	: 0001-8531	: 10	: (0)	: 0.003	: 0.003	: < 0.01	:
PDC	: 0001-9943	: 75	: 110	: 0.003	: 0.06	: 0.01	:
PER	: 0002-3698	: 50	: 200	: 0.004	: 0.06	: 0.01	:
B-TRI	: 0002-3687	: 10	: (0)	: 0.003	: 0.003	: < 0.01	:

NOTE : ALL RESULTS IN PPM UNLESS OTHERWISE NOTED.

RCL EQUATION : PPM VOLUME OF RCLS IN AIR =

(WEIGHT OF CS2 IN GRAMS) (.0821) (DEGREES K) (PPM FROM CHROMATOGRAM)

(MW) (L)

WHERE : CS2 = CARBON DISULFIDE USED FOR DESORPTION
.0821 = GAS CONSTANT (CONVERTS GRAMS TO LITERS)
DEGREES K = DEGREES KELVIN (DEGREES CENTIGRADE + 273)
MW = MOLECULAR WEIGHT OF SPECIFIC COMPOUND
L = LITERS OF AIR SAMPLED