LABORATORY RESULTS
CLIENT: CLEAN TECH

REPORT NUMBER: 38436 SAMPLE ID: 5022504 DESCRIPTION: CHRYSLER ACUSTAR 95-1-MWC1-2

DATE SAMPLED.....: 02/20/95
TIME SAMPLED.....: 09:15

DATE RECEIVED.....: 02/27/95
TIME RECEIVED.....: 10:40

ANALYSES PERFORMED	ANALYTICAL RESULT	UNITS OF MEASURE		ANALYTICAL METHOD	RUN DATE	TECHN
1,2-Dibromo-3-chloropropane	< 1.0	ug/l				
1,2-Dichlorobenzene	< 1.0	ug/l				
1,3-Dichlorobenzene	< 1.0	ug/l				
1,4-Dichlorobenzene	< 1.0	ug/l				
Dichlorodifluoromethane	< 1.0	ug/l				
1,1-Dichloroethane	< 1.0	ug/l				
1,2-Dichloroethane	< 1.0	ug/l				
1,1-Dichloroethene	< 1.0	ug/l				
Cis-1,2 Dichloroethylene	< 1.0	ug/l				
Trans-1,2 Dichloroethylene	< 1.0	ug/l				
1,2-Dichloroethene (total)	< 2.0	ug/l				
Dichloromethane	< 1.0	ug/l				
1,2-Dichloropropane	< 1.0	ug/l				
1,3-Dichloropropane	< 1.0	ug/l				
2,2-Dichloropropane	< 1.0	ug/l				
1,1-Dichloropropene	< 1.0	ug/l				
Cis-1,3-Dichloropropene	< 1.0	ug/l				
ans-1,3-Dichloropropene	< 1.0	ug/l				
hylbenzene	< 1.0	ug/l				
Hexachlorobutadiene	< 2.0	ug/l				
2-Hexanone	< 50	ug/l				
Isopropyltoluene	< 1.0	ug/l				
4-Isopropyltoluene *	< 1.0	ug/l				
4-Methyl-2-Pentanone	< 50	ug/l				
Naphthalene	< 5.0	ug/l				
n-Propylbenzene	< 1.0	ug/l				
Styrene	< 1.0	ug/l				
1,1,1,2-Tetrachloroethane	< 1.0	ug/l				
1,1,2,2-Tetrachloroethane	< 1.0	ug/l				
Tetrachloroethylene	< 1.0	ug/l				
Toluene	< 1.0	ug/l				
1,2,3-Trichlorobenzene	< 1.0	ug/l				
1,2,4-Trichlorobenzene	< 1.0	ug/l				
1,1,1-Trichloroethane	< 1.0	ug/l				
1,1,2-Trichloroethane	< 1.0	ug/l				
Trichloroethene	< 1.0	ug/l				
Trichlorofluoromethane	< 1.0	ug/l				
1,2,3-Trichloropropane	< 1.0	ug/l				
1,2,4-Trimethylbenzene	< 1.0	ug/l				
1,3,5-Trimethlybenzene	< 1.0	ug/l				
Vinyl Acetate	< 100	ug/l				
Vinyl Chloride	< 1.0	ug/l				
MP-Xylene	< 2.0	ug/l				
O-Xylene	< 1.0	ug/l				

* Tentative identification and quantitation based on a computer generated library search per section 7.6.1.2, EPA Method 8260

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Canton Analytical Laboratory, Inc.

QA/QC KN

LABORATORY RESULTS
CLIENT: CLEAN TECH

REPORT NUMBER: 38436 SAMPLE ID: 5022504 DESCRIPTION: CHRYSLER ACUSTAR 95-1-MWC1-2

DATE SAMPLED.....: 02/20/95
TIME SAMPLED.....: 09:15

DATE RECEIVED.....: 02/27/95
TIME RECEIVED.....: 10:40

ANALYSES PERFORMED	ANALYTICAL RESULT	UNITS OF MEASURE		ANALYTICAL METHOD	RUN DATE	TECHN
Xylenes, Total	< 3.0	ug/l				
Chloroethane	< 1.0	ug/l				

* Tentative identification and quantitation based on a computer generated library search per section 7.6.1.2, EPA Method 8260

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QA/QC KW

LABORATORY RESULTS
CLIENT: CLEAN TECH

REPORT NUMBER: 38436 SAMPLE ID: 5022506 DESCRIPTION: CHRYSLER ACUSTAR 95-1-MWC2-2

DATE SAMPLED.....: 02/20/95
TIME SAMPLED.....: 12:25

DATE RECEIVED.....: 02/27/95
TIME RECEIVED.....: 10:40

ANALYSES PERFORMED	ANALYTICAL RESULT	UNITS OF MEASURE		ANALYTICAL METHOD	RUN DATE	TECHN
DISSOLVED METALS						
TAL METALS						
Aluminum	< 0.14	mg/l		EPA 200.7	02/28/95	SD
Barium	0.25	mg/l		EPA 200.7	02/28/95	SD
Beryllium	< 0.01	mg/l		EPA 200.7	02/28/95	SD
Cadmium	< 0.01	mg/l		EPA 200.7	02/28/95	SD
Calcium	84	mg/l		EPA 200.7	03/03/95	SD
Chromium	< 0.02	mg/l		EPA 200.7	02/28/95	SD
Cobalt	0.03	mg/l		EPA 200.7	02/28/95	SD
Silver	0.04	mg/l		EPA 200.7	02/28/95	SD
Copper	< 0.02	mg/l		EPA 200.7	02/28/95	SD
Sodium	20	mg/l		EPA 200.7	03/03/95	SD
Vanadium	< 0.02	mg/l		EPA 200.7	02/28/95	SD
Zinc	< 0.02	mg/l		EPA 200.7	02/28/95	SD
Antimony, GFAA	0.0043	mg/l		EPA 204.2	03/02/95	NS
Arsenic, GFAA	0.0063	mg/l		EPA 206.2	03/02/95	NS
Lead, GFAA	< 0.001	mg/l		EPA 239.2	03/01/95	NS
Selenium, GFAA	< 0.002	mg/l		EPA 270.2	03/01/95	NS
Thallium, GFAA	0.0054	mg/l		EPA 279.2	03/02/95	NS
Mercury, Cold Vapor	< 0.0002	mg/l		EPA 245.2	02/28/95	SD
TCL VOLATILE ORGANICS, GC/MS				EPA 8260	03/06/95	JB
Acetone	< 50	ug/l				
Acrolein	< 50	ug/l				
Acrylonitrile	< 5.0	ug/l				
Benzene	< 1.0	ug/l				
Bromobenzene	< 1.0	ug/l				
Bromochloromethane	< 1.0	ug/l				
Bromodichloromethane	< 1.0	ug/l				
Bromoform	< 1.0	ug/l				
Bromomethane	< 1.0	ug/l				
2-Butanone	< 50	ug/l				
n-Butylbenzene	< 1.0	ug/l				
Sec-Butylbenzene	< 1.0	ug/l				
tert-Butylbenzene	< 1.0	ug/l				
Carbon Disulfide	< 50	ug/l				
Carbon Tetrachloride	< 1.0	ug/l				
Chlorobenzene	< 1.0	ug/l				
Chloroform	< 1.0	ug/l				
Chloromethane	< 1.0	ug/l				
2-Chlorotoluene	< 1.0	ug/l				
4-Chlorotoluene	< 1.0	ug/l				
Dibromochloromethane	< 1.0	ug/l				
1,2-Dibromoethane	< 1.0	ug/l				
Dibromomethane	< 1.0	ug/l				

* Tentative identification and quantitation based on a computer generated library search per section 7.6.1.2, EPA Method 8260

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LABORATORY RESULTS
CLIENT: CLEAN TECH

REPORT NUMBER: 38436 SAMPLE ID: 5022506 DESCRIPTION: CHRYSLER ACUSTAR 95-1-MWC2-2

DATE SAMPLED.....: 02/20/95
TIME SAMPLED.....: 12:25

DATE RECEIVED.....: 02/27/95
TIME RECEIVED.....: 10:40

ANALYSES PERFORMED	ANALYTICAL RESULT	UNITS OF MEASURE		ANALYTICAL METHOD	RUN DATE	TECHN
1,2-Dibromo-3-chloropropane	< 1.0	ug/l				
1,2-Dichlorobenzene	< 1.0	ug/l				
1,3-Dichlorobenzene	< 1.0	ug/l				
1,4-Dichlorobenzene	< 1.0	ug/l				
Dichlorodifluoromethane	< 1.0	ug/l				
1,1-Dichloroethane	< 1.0	ug/l				
1,2-Dichloroethane	< 1.0	ug/l				
1,1-Dichloroethene	< 1.0	ug/l				
Cis-1,2 Dichloroethylene	< 1.0	ug/l				
Trans-1,2 Dichloroethylene	< 1.0	ug/l				
1,2-Dichloroethene (total)	< 2.0	ug/l				
Dichloromethane	< 1.0	ug/l				
1,2-Dichloropropane	< 1.0	ug/l				
1,3-Dichloropropane	< 1.0	ug/l				
2,2-Dichloropropane	< 1.0	ug/l				
1,1-Dichloropropene	< 1.0	ug/l				
Cis-1,3-Dichloropropene	< 1.0	ug/l				
Trans-1,3-Dichloropropene	< 1.0	ug/l				
Ethylbenzene	< 1.0	ug/l				
Hexachlorobutadiene	< 2.0	ug/l				
2-Hexanone	< 50	ug/l				
Isopropyltoluene	< 1.0	ug/l				
4-Isopropyltoluene *	< 1.0	ug/l				
4-Methyl-2-Pentanone	< 50	ug/l				
Naphthalene	< 5.0	ug/l				
n-Propylbenzene	< 1.0	ug/l				
Styrene	< 1.0	ug/l				
1,1,1,2-Tetrachloroethane	< 1.0	ug/l				
1,1,2,2-Tetrachloroethane	< 1.0	ug/l				
Tetrachloroethylene	< 1.0	ug/l				
Toluene	< 1.0	ug/l				
1,2,3-Trichlorobenzene	< 1.0	ug/l				
1,2,4-Trichlorobenzene	< 1.0	ug/l				
1,1,1-Trichloroethane	< 1.0	ug/l				
1,1,2-Trichloroethane	< 1.0	ug/l				
Trichloroethene	< 1.0	ug/l				
Trichlorofluoromethane	< 1.0	ug/l				
1,2,3-Trichloropropane	< 1.0	ug/l				
1,2,4-Trimethylbenzene	< 1.0	ug/l				
1,3,5-Trimethlybenzene	< 1.0	ug/l				
Vinyl Acetate	< 100	ug/l				
Vinyl Chloride	< 1.0	ug/l				
MP-Xylene	< 2.0	ug/l				
O-Xylene	< 1.0	ug/l				

* Tentative identification and quantitation based on a computer generated library search per section 7.6.1.2, EPA Method 8260

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Canton Analytical Laboratory, Inc.

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LABORATORY RESULTS
CLIENT: CLEAN TECH

REPORT NUMBER: 38436 SAMPLE ID: 5022506 DESCRIPTION: CHRYSLER ACUSTAR 95-1-MWC2-2

DATE SAMPLED.....: 02/20/95
TIME SAMPLED.....: 12:25

DATE RECEIVED.....: 02/27/95
TIME RECEIVED.....: 10:40

ANALYSES PERFORMED	ANALYTICAL RESULT	UNITS OF MEASURE		ANALYTICAL METHOD	RUN DATE	TECHN
Xylenes, Total	< 3.0	ug/l				
Chloroethane	< 1.0	ug/l				

* Tentative identification and quantitation based on a computer generated library search per section 7.6.1.2, EPA Method 8260

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LABORATORY RESULTS
CLIENT: CLEAN TECH

REPORT NUMBER: 38436 SAMPLE ID: 5022510 DESCRIPTION: CHRYSLER ACUSTAR 95-1-MWC3-2

DATE SAMPLED.....: 02/20/95
TIME SAMPLED.....: 15:10

DATE RECEIVED.....: 02/27/95
TIME RECEIVED.....: 10:40

ANALYSES PERFORMED	ANALYTICAL RESULT	UNITS OF MEASURE		ANALYTICAL METHOD	RUN DATE	TECHN
DISSOLVED METALS						
TAL METALS						
Aluminum	< 0.14	mg/l		EPA 200.7	02/28/95	SD
Barium	0.14	mg/l		EPA 200.7	02/28/95	SD
Beryllium	< 0.01	mg/l		EPA 200.7	02/28/95	SD
Cadmium	< 0.01	mg/l		EPA 200.7	02/28/95	SD
Calcium	120	mg/l		EPA 200.7	03/03/95	SD
Chromium	< 0.02	mg/l		EPA 200.7	02/28/95	SD
Cobalt	< 0.02	mg/l		EPA 200.7	02/28/95	SD
Silver	< 0.03	mg/l		EPA 200.7	02/28/95	SD
Copper	< 0.02	mg/l		EPA 200.7	02/28/95	SD
Sodium	43	mg/l		EPA 200.7	03/03/95	SD
Vanadium	< 0.02	mg/l		EPA 200.7	02/28/95	SD
Zinc	< 0.02	mg/l		EPA 200.7	02/28/95	SD
Antimony, GFAA	< 0.003	mg/l		EPA 204.2	03/02/95	NS
Arsenic, GFAA	< 0.002	mg/l		EPA 206.2	03/02/95	NS
Lead, GFAA	< 0.001	mg/l		EPA 239.2	03/01/95	NS
Selenium, GFAA	< 0.002	mg/l		EPA 270.2	03/01/95	NS
Thallium, GFAA	0.007	mg/l		EPA 279.2	03/02/95	NS
Mercury, Cold Vapor	< 0.0002	mg/l		EPA 245.2	02/28/95	SD
TCL VOLATILE ORGANICS, GC/MS				EPA 8260	03/06/95	JB
Acetone	< 50	ug/l				
Acrolein	< 50	ug/l				
Acrylonitrile	< 5.0	ug/l				
Benzene	< 1.0	ug/l				
Bromobenzene	< 1.0	ug/l				
Bromochloromethane	< 1.0	ug/l				
Bromodichloromethane	< 1.0	ug/l				
Bromoform	< 1.0	ug/l				
Bromomethane	< 1.0	ug/l				
2-Butanone	< 50	ug/l				
n-Butylbenzene	< 1.0	ug/l				
Sec-Butylbenzene	< 1.0	ug/l				
tert-Butylbenzene	< 1.0	ug/l				
Carbon Disulfide	< 50	ug/l				
Carbon Tetrachloride	< 1.0	ug/l				
Chlorobenzene	< 1.0	ug/l				
Chloroform	< 1.0	ug/l				
Chloromethane	< 1.0	ug/l				
2-Chlorotoluene	< 1.0	ug/l				
4-Chlorotoluene	< 1.0	ug/l				
Dibromochloromethane	< 1.0	ug/l				
1,2-Dibromoethane	< 1.0	ug/l				
Dibromomethane	< 1.0	ug/l				

* Tentative identification and quantitation based on a computer generated library search per section 7.6.1.2, EPA Method 8260

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LABORATORY RESULTS
CLIENT: CLEAN TECH

REPORT NUMBER: 38436 SAMPLE ID: 5022510 DESCRIPTION: CHRYSLER ACUSTAR 95-1-MWC3-2

DATE SAMPLED.....: 02/20/95
TIME SAMPLED.....: 15:10

DATE RECEIVED.....: 02/27/95
TIME RECEIVED.....: 10:40

ANALYSES PERFORMED	ANALYTICAL RESULT	UNITS OF MEASURE		ANALYTICAL METHOD	RUN DATE	TECHN
1,2-Dibromo-3-chloropropane	< 1.0	ug/l				
1,2-Dichlorobenzene	< 1.0	ug/l				
1,3-Dichlorobenzene	< 1.0	ug/l				
1,4-Dichlorobenzene	< 1.0	ug/l				
Dichlorodifluoromethane	< 1.0	ug/l				
1,1-Dichloroethane	< 1.0	ug/l				
1,2-Dichloroethane	< 1.0	ug/l				
1,1-Dichloroethene	< 1.0	ug/l				
Cis-1,2 Dichloroethylene	< 1.0	ug/l				
Trans-1,2 Dichloroethylene	< 1.0	ug/l				
1,2-Dichloroethene (total)	< 2.0	ug/l				
Dichloromethane	< 1.0	ug/l				
1,2-Dichloropropane	< 1.0	ug/l				
1,3-Dichloropropane	< 1.0	ug/l				
2,2-Dichloropropane	< 1.0	ug/l				
1,1-Dichloropropene	< 1.0	ug/l				
Cis-1,3-Dichloropropene	< 1.0	ug/l				
Trans-1,3-Dichloropropene	< 1.0	ug/l				
Ethylbenzene	< 1.0	ug/l				
Hexachlorobutadiene	< 2.0	ug/l				
2-Hexanone	< 50	ug/l				
Isopropyltoluene	< 1.0	ug/l				
4-Isopropyltoluene *	< 1.0	ug/l				
4-Methyl-2-Pentanone	< 50	ug/l				
Naphthalene	< 5.0	ug/l				
n-Propylbenzene	< 1.0	ug/l				
Styrene	< 1.0	ug/l				
1,1,1,2-Tetrachloroethane	< 1.0	ug/l				
1,1,2,2-Tetrachloroethane	< 1.0	ug/l				
Tetrachloroethylene	< 1.0	ug/l				
Toluene	< 1.0	ug/l				
1,2,3-Trichlorobenzene	< 1.0	ug/l				
1,2,4-Trichlorobenzene	< 1.0	ug/l				
1,1,1-Trichloroethane	< 1.0	ug/l				
1,1,2-Trichloroethane	< 1.0	ug/l				
Trichloroethene	< 1.0	ug/l				
Trichlorofluoromethane	< 1.0	ug/l				
1,2,3-Trichloropropane	< 1.0	ug/l				
1,2,4-Trimethylbenzene	< 1.0	ug/l				
1,3,5-Trimethlybenzene	< 1.0	ug/l				
Vinyl Acetate	< 100	ug/l				
Vinyl Chloride	< 1.0	ug/l				
MP-Xylene	< 2.0	ug/l				
O-Xylene	< 1.0	ug/l				

* Tentative identification and quantitation based on a computer generated library search per section 7.6.1.2, EPA Method 8260

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LABORATORY RESULTS
CLIENT: CLEAN TECH

REPORT NUMBER: 38436 SAMPLE ID: 5022510 DESCRIPTION: CHRYSLER ACUSTAR 95-1-MWC3-2

DATE SAMPLED.....: 02/20/95
TIME SAMPLED.....: 15:10

DATE RECEIVED.....: 02/27/95
TIME RECEIVED.....: 10:40

ANALYSES PERFORMED	ANALYTICAL RESULT	UNITS OF MEASURE		ANALYTICAL METHOD	RUN DATE	TECHN
Xylenes, Total	< 3.0	ug/l				
Chloroethane	< 1.0	ug/l				

* Tentative identification and quantitation based on a computer generated library search per section 7.6.1.2, EPA Method 8260

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LABORATORY RESULTS
CLIENT: CLEAN TECH

REPORT NUMBER: 38436 SAMPLE ID: 5022518 DESCRIPTION: CHRYSLER ACUSTAR 95-4-EB-2

DATE SAMPLED.....: 02/21/95
TIME SAMPLED.....: 11:40

DATE RECEIVED.....: 02/27/95
TIME RECEIVED.....: 10:40

ANALYSES PERFORMED	ANALYTICAL RESULT	UNITS OF MEASURE		ANALYTICAL METHOD	RUN DATE	TECHN
TCL VOLATILE ORGANICS, GC/MS				EPA 8260	03/07/95	JB
Acetone	< 50	ug/l				
Acrolein	< 50	ug/l				
Acrylonitrile	< 5.0	ug/l				
Benzene	< 1.0	ug/l				
Bromobenzene	< 1.0	ug/l				
Bromochloromethane	< 1.0	ug/l				
Bromodichloromethane	< 1.0	ug/l				
Bromoform	< 1.0	ug/l				
Bromomethane	< 1.0	ug/l				
2-Butanone	< 50	ug/l				
n-Butylbenzene	< 1.0	ug/l				
Sec-Butylbenzene	< 1.0	ug/l				
tert-Butylbenzene	< 1.0	ug/l				
Carbon Disulfide	< 50	ug/l				
Carbon Tetrachloride	< 1.0	ug/l				
Chlorobenzene	< 1.0	ug/l				
Chloroform	< 1.0	ug/l				
Chloromethane	< 1.0	ug/l				
2-Chlorotoluene	< 1.0	ug/l				
4-Chlorotoluene	< 1.0	ug/l				
Dibromochloromethane	< 1.0	ug/l				
1,2-Dibromoethane	< 1.0	ug/l				
Dibromomethane	< 1.0	ug/l				
1,2-Dibromo-3-chloropropane	< 1.0	ug/l				
1,2-Dichlorobenzene	< 1.0	ug/l				
1,3-Dichlorobenzene	< 1.0	ug/l				
1,4-Dichlorobenzene	< 1.0	ug/l				
Dichlorodifluoromethane	< 1.0	ug/l				
1,1-Dichloroethane	< 1.0	ug/l				
1,2-Dichloroethane	< 1.0	ug/l				
1,1-Dichloroethene	< 1.0	ug/l				
Cis-1,2 Dichloroethylene	< 1.0	ug/l				
Trans-1,2 Dichloroethylene	< 1.0	ug/l				
1,2-Dichloroethene (total)	< 2.0	ug/l				
Dichloromethane	< 1.0	ug/l				
1,2-Dichloropropane	< 1.0	ug/l				
1,3-Dichloropropane	< 1.0	ug/l				
2,2-Dichloropropane	< 1.0	ug/l				
1,1-Dichloropropene	< 1.0	ug/l				
Cis-1,3-Dichloropropene	< 1.0	ug/l				
Trans-1,3-Dichloropropene	< 1.0	ug/l				
Ethylbenzene	< 1.0	ug/l				
Hexachlorobutadiene	< 2.0	ug/l				

* Tentative identification and quantitation based on a computer generated library search per section 7.6.1.2, EPA Method 8260

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QA/QC KN

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LABORATORY RESULTS
CLIENT: CLEAN TECH

REPORT NUMBER: 38436 SAMPLE ID: 5022518 DESCRIPTION: CHRYSLER ACUSTAR 95-4-EB-2

DATE SAMPLED.....: 02/21/95
TIME SAMPLED.....: 11:40

DATE RECEIVED.....: 02/27/95
TIME RECEIVED.....: 10:40

ANALYSES PERFORMED	ANALYTICAL RESULT	UNITS OF MEASURE		ANALYTICAL METHOD	RUN DATE	TECHN
2-Hexanone	< 50	ug/l				
Isopropyltoluene	< 1.0	ug/l				
4-Isopropyltoluene *	< 1.0	ug/l				
4-Methyl-2-Pentanone	< 50	ug/l				
Naphthalene	< 5.0	ug/l				
n-Propylbenzene	< 1.0	ug/l				
Styrene	< 1.0	ug/l				
1,1,1,2-Tetrachloroethane	< 1.0	ug/l				
1,1,2,2-Tetrachloroethane	< 1.0	ug/l				
Tetrachloroethylene	< 1.0	ug/l				
Toluene	< 1.0	ug/l				
1,2,3-Trichlorobenzene	< 1.0	ug/l				
1,2,4-Trichlorobenzene	< 1.0	ug/l				
1,1,1-Trichloroethane	< 1.0	ug/l				
1,1,2-Trichloroethane	< 1.0	ug/l				
Trichloroethene	1.2	ug/l				
Trichlorofluoromethane	< 1.0	ug/l				
1,2,3-Trichloropropane	< 1.0	ug/l				
1,2,4-Trimethylbenzene	< 1.0	ug/l				
1,3,5-Trimethlybenzene	< 1.0	ug/l				
Vinyl Acetate	< 100	ug/l				
Vinyl Chloride	< 1.0	ug/l				
MP-Xylene	< 2.0	ug/l				
O-Xylene	< 1.0	ug/l				
Xylenes, Total	< 3.0	ug/l				
Chloroethane	< 1.0	ug/l				

* Tentative identification and quantitation based on a computer generated library search per section 7.6.1.2, EPA Method 8260

The results above apply only to the sample analyzed. This report may only be reproduced in full, and may only be submitted to a third party with the written permission of CLEAN TECH

Canton Analytical Laboratory, Inc.

QA/QC KN

Trip Blank

LABORATORY RESULTS
CLIENT: CLEAN TECH

REPORT NUMBER: 38436 SAMPLE ID: 5022519 DESCRIPTION: CHRYSLER ACUSTAR 95-4-TB-2

DATE SAMPLED.....: 02/21/95
TIME SAMPLED.....: 11:45

DATE RECEIVED.....: 02/27/95
TIME RECEIVED.....: 10:40

ANALYSES PERFORMED	ANALYTICAL RESULT	UNITS OF MEASURE		ANALYTICAL METHOD	RUN DATE	TECHN
TCL VOLATILE ORGANICS, GC/MS				EPA 8260	03/07/95	JB
Acetone	< 50	ug/l				
Acrolein	< 50	ug/l				
Acrylonitrile	< 5.0	ug/l				
Benzene	< 1.0	ug/l				
Bromobenzene	< 1.0	ug/l				
Bromochloromethane	< 1.0	ug/l				
Bromodichloromethane	< 1.0	ug/l				
Bromoform	< 1.0	ug/l				
Bromomethane	< 1.0	ug/l				
2-Butanone	< 50	ug/l				
n-Butylbenzene	< 1.0	ug/l				
Sec-Butylbenzene	< 1.0	ug/l				
tert-Butylbenzene	< 1.0	ug/l				
Carbon Disulfide	< 50	ug/l				
Carbon Tetrachloride	< 1.0	ug/l				
Chlorobenzene	< 1.0	ug/l				
Chloroform	< 1.0	ug/l				
Chloromethane	< 1.0	ug/l				
2-Chlorotoluene	< 1.0	ug/l				
4-Chlorotoluene	< 1.0	ug/l				
Dibromochloromethane	< 1.0	ug/l				
1,2-Dibromoethane	< 1.0	ug/l				
Dibromomethane	< 1.0	ug/l				
1,2-Dibromo-3-chloropropane	< 1.0	ug/l				
1,2-Dichlorobenzene	< 1.0	ug/l				
1,3-Dichlorobenzene	< 1.0	ug/l				
1,4-Dichlorobenzene	< 1.0	ug/l				
Dichlorodifluoromethane	< 1.0	ug/l				
1,1-Dichloroethane	< 1.0	ug/l				
1,2-Dichloroethane	< 1.0	ug/l				
1,1-Dichloroethene	< 1.0	ug/l				
Cis-1,2 Dichloroethylene	< 1.0	ug/l				
Trans-1,2 Dichloroethylene	< 1.0	ug/l				
1,2-Dichloroethene (total)	< 2.0	ug/l				
Dichloromethane	< 1.0	ug/l				
1,2-Dichloropropane	< 1.0	ug/l				
1,3-Dichloropropane	< 1.0	ug/l				
2,2-Dichloropropane	< 1.0	ug/l				
1,1-Dichloropropene	< 1.0	ug/l				
Cis-1,3-Dichloropropene	< 1.0	ug/l				
Trans-1,3-Dichloropropene	< 1.0	ug/l				
Ethylbenzene	< 1.0	ug/l				
Hexachlorobutadiene	< 2.0	ug/l				

* Tentative identification and quantitation based on a computer generated library search per section 7.6.1.2, EPA Method 8260

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Canton Analytical Laboratory, Inc.

QA/QC KW

TRIP BLANK

LABORATORY RESULTS
CLIENT: CLEAN TECH

REPORT NUMBER: 38436 SAMPLE ID: 5022519 DESCRIPTION: CHRYSLER ACUSTAR 95-4-TB-2

DATE SAMPLED.....: 02/21/95
TIME SAMPLED.....: 11:45

DATE RECEIVED.....: 02/27/95
TIME RECEIVED.....: 10:40

ANALYSES PERFORMED	ANALYTICAL RESULT	UNITS OF MEASURE		ANALYTICAL METHOD	RUN DATE	TECHN
2-Hexanone	< 50	ug/l				
Isopropyltoluene	< 1.0	ug/l				
4-Isopropyltoluene *	< 1.0	ug/l				
4-Methyl-2-Pentanone	< 50	ug/l				
Naphthalene	< 5.0	ug/l				
n-Propylbenzene	< 1.0	ug/l				
Styrene	< 1.0	ug/l				
1,1,1,2-Tetrachloroethane	< 1.0	ug/l				
1,1,2,2-Tetrachloroethane	< 1.0	ug/l				
Tetrachloroethylene	< 1.0	ug/l				
Toluene	< 1.0	ug/l				
1,2,3-Trichlorobenzene	< 1.0	ug/l				
1,2,4-Trichlorobenzene	< 1.0	ug/l				
1,1,1-Trichloroethane	< 1.0	ug/l				
1,1,2-Trichloroethane	< 1.0	ug/l				
Trichloroethene	< 1.0	ug/l				
Trichlorofluoromethane	< 1.0	ug/l				
1,2,3-Trichloropropane	< 1.0	ug/l				
1,2,4-Trimethylbenzene	< 1.0	ug/l				
1,3,5-Trimethlybenzene	< 1.0	ug/l				
Vinyl Acetate	< 100	ug/l				
Vinyl Chloride	< 1.0	ug/l				
MP-Xylene	< 2.0	ug/l				
O-Xylene	< 1.0	ug/l				
Xylenes, Total	< 3.0	ug/l				
Chloroethane	< 1.0	ug/l				

* Tentative identification and quantitation based on a computer generated library search per section 7.6.1.2, EPA Method 8260

The results above apply only to the sample analyzed. This report may only be reproduced in full, and may only be submitted to a third party with the written permission of CLEAN TECH

Canton Analytical Laboratory, Inc.

QA/QC KV

LAB CODE# CAL

CHAIN TECHNOLOGIES

2700 Capitol Trail • NEWARK, DELAWARE 19711
PHONE: (302) 999-0924 • FAX: (302) 999-0925

PO# 4[illegible]
(Do Not Process Without Purchase Order Number)

CHAIN OF CUSTODY RECORD

PROJECT: CHRYSLER - Acuster - Dayton - Groundwater sampling II

SAMPLERS: (Signature) [illegible]

SAMPLE NAME	ANALYSIS REQ'D	DATE START	DATE END	TIME START	TIME END	SAMPLE TYPE Water Comp	Water Grab	Sediment Comp	Sediment Grab	Tissue	Air	Oil	Other	NO. OF CONTAINERS	REMARKS
95-1-MWC1 -2	VOCs *	–	2/20	–	0915		✓							2	HCl added
	metals *	–	2/20	–	0915		✓							1	Filtered/HNO_3 added
95-1-MWB1 -2	VOCs *	–	2/20	–	1040		✓							2	HCl added
	metals *	–	2/20	–	1040		✓							1	Filtered/HNO_3 added
95-1-MWC2 -2	VOCs *	–	2/20	–	1225		✓							2	HCl added
	metals *	–	2/20	–	1225		✓							1	Filtered/HNO_3 added
95-1-MWB2 -2	VOCs *	–	2/20	–	1255		✓							2	HCl added
	metals *	–	2/20	–	1255		✓							1	Filtered/HNO_3 added
95-2-MWB2 -2	metals *	–	2/20	–	1300		✓							1	Filtered/HNO_3 added
95-1-MWB5 -2	VOCs *	–	2/20	–	1405		✓							2	HCl added.

Relinquished by: (Signature) [illegible]	Received by: (Signature) [illegible]	Date 2/20	Time 2000
Relinquished by: (Signature)	Received by: (Signature) Jan Blazin	Date 2/27	Time 10:40
Relinquished by: (Signature)	Received by: (Signature)	Date	Time
Relinquished by: (Signature)	Received by Mobile Laboratory for field analysis: (Signature)	Date	Time
Dispatched by: (Signature) — Date — Time	Received for Laboratory by:	Date	Time
Method of Shipment:			

Distribution: Orig. - Accompany Shipment
1 Copy - Survey Coordinator Field Files

* - As per our contract w/ Kae Eppert

PAGE 1 of 1

PAGE 2 of 4

LAB CODE# CAL

CLEAR TECHNOLOGIES

2700 Capitol Trail • NEWARK, DELAWARE 19711
PHONE: (302) 999-0924 • FAX: (302) 999-0925

PO# _____
(Do Not Process Without Purchase Order Number)

CHAIN OF CUSTODY RECORD

PROJECT: Austin - GW II

SAMPLERS: (Signature)

SAMPLE NAME	ANALYSIS REQ'D	DATE START	DATE END	TIME START	TIME END	SAMPLE TYPE: Water Comp	Water Grab	Sediment Comp	Sediment Grab	Tissue	Air	Oil	Other	NO. OF CONTAINERS	REMARKS
95-1-MWB5-2	metals *	-	2/20	-	1405		✓							1	Filtered / HNO3 added
95-1-MWC3-2	vous *	-	2/20	-	1510		✓							2	HCl added
	metals *	-	2/20	-	1510		✓							1	Filtered / HNO3 added
95-1-MWB3-2	vous *	-	2/20	-	1550		✓							2	HCl added
	metals *	-	2/20	-	1550		✓							1	Filtered / HNO3 added
95-2-MWB3-2	vous *	-	2/20	-	1555		✓							2	HCl added
95-1-MWA2-2	vous *	-	2/20	-	1815		✓							2	HCl added
	metals *	-	2/20	-	1815		✓							1	Filtered / HNO3 added
95-1-MWA4-2	vous *	-	2/20	-	1845		✓							2	HCl added
	metals *	-	2/20	-	1845		✓							1	Filtered / HNO3 added

Relinquished by: (Signature) [signature]	Received by: (Signature) Jan Blazin	Date 2/27	Time 10:40
Relinquished by: (Signature)	Received by: (Signature)	Date	Time
Relinquished by: (Signature)	Received by: (Signature)	Date	Time
Relinquished by: (Signature)	Received by Mobile Laboratory for field analysis: (Signature)	Date	Time
Dispatched by: (Signature) Date Time	Received for Laboratory by:	Date	Time

Method of Shipment:

Distribution: Orig. - Accompany Shipment
1 Copy - Survey Coordinator Field Files

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LAB CODE# CAL

CLEAR TECHNOLOGIES

2700 Capitol Trail • NEWARK, DELAWARE 19711
PHONE: (302) 999-0924 • FAX: (302) 999-0925

PO# _____
(Do Not Process Without Purchase Order Number)

CHAIN OF CUSTODY RECORD

PROJECT Acuster Gen-II

SAMPLERS: (Signature)

SAMPLE NAME	ANALYSIS REQ'D	DATE START	DATE END	TIME START	TIME END	SAMPLE TYPE: Water Comp	Water Grab	Sediment Comp	Sediment Grab	Tissue	Air	Oil	Other	NO. OF CONTAINERS	REMARKS
95-1-MWA1-2	Voas *	–	2/21	–	0935		✓							2	HCl preserved
	metals *	–	2/21	–	0935		✓							1	Filtered/HNO3 added
95-1-MWB4-2	voas *	–	2/21	–	1025		✓							2	HCl preserved
	metals *	–	2/21	–	1025		✓							1	Filtered/HNO3 added
95-1-MWA5-2	voas *	–	2/21	–	1125		✓							2	HCl preserved
	metals *	–	2/21	–	1125		✓							1	Filtered/HNO3 added
95-4-EB-2	Voas *	–	2/21	–	1140		✓							2	HCl preserved
95-4-TB-2	voas *	–	2/21	–	1145		✓							2	HCl preserved
95-1-MWB6-2	voas *	–	2/21	–	1300		✓							2	HCl preserved
	metals *	–	2/21	–	1300		✓							1	Filtered/HNO3 added

Relinquished by: (Signature) [signature]	Received by: (Signature) Jan Blazin	Date 2/27	Time 10:40
Relinquished by: (Signature)	Received by: (Signature)	Date	Time
Relinquished by: (Signature)	Received by: (Signature)	Date	Time
Relinquished by: (Signature)	Received by Mobile Laboratory for field analysis: (Signature)	Date	Time
Dispatched by: (Signature) Date Time	Received for Laboratory by:	Date	Time

Method of Shipment:

Distribution: Orig. - Accompany Shipment
1 Copy - Survey Coordinator Field Files

LAB CODE# CAL

CLAYTECHNOLOGIES

2700 Capitol Trail • NEWARK, DELAWARE 19711
PHONE: (302) 999-0924 • FAX: (302) 999-0925

PO#
(Do Not Process Without Purchase Order Number)

CHAIN OF CUSTODY RECORD

PROJECT: Acustar GW II

SAMPLERS: (Signature)

SAMPLE NAME	ANALYSIS REQ'D	DATE START	DATE END	TIME START	TIME END	Water Comp	Water Grab	Sediment Comp	Sediment Grab	Tissue	Air	Oil	Other	NO. OF CONTAINERS	REMARKS
95-1-MWA3-2	VOCs*	–	2/21	–	1340		✓							2	HCl preserved
	metals*	–	2/21	–	1340		✓							1	Filtered/HNO3 added
95-1-MWA6-2	VOCs*	–	2/21	–	1410		✓							2	HCl preserved
	metals*	–	2/21	–	1410		✓							1	Filtered/HNO3 added

Relinquished by: (Signature)

Relinquished by: (Signature)

Relinquished by: (Signature)

Relinquished by: (Signature)

Received by: (Signature) John Blazer — Date 2/27 — Time 10:40

Received by: (Signature) — Date — Time

Received by: (Signature) — Date — Time

Received by Mobile Laboratory for field analysis: (Signature) — Date — Time

Received for Laboratory by: — Date — Time

Dispatched by: (Signature) — Date — Time

Method of Shipment:

Distribution: Orig. - Accompany Shipment
1 Copy - Survey Coordinator Field Files

PAGE 4 of 4

Miami Valley Regional
Planning Commission

117 South Main Street
Suite 200
Dayton, Ohio 45402
513/223-6323

Chairman
Georgia P. Hale

Executive Director
Nora E. Lake

SENT OUT 12-11-86
JQ

December 12, 1986

EPA Region 5 Records Ctr.
349882

Mr. R. C. Johnson
Plant Manager
Chrysler Corporation
1600 Webster Street
Dayton, OH 45404

Dear Mr. Johnson:

The Miami Valley Regional Planning Commission has been designated as the lead agency for the development of a detailed work plan for the generation of a management program for the Great Miami buried valley aquifer in Montgomery, Greene, Darke, Preble and Miami Counties, Ohio.

The Great Miami aquifer is a buried valley system filled with fluvial glacial materials which have extraordinary qualities as an abundant source of high quality ground water. The historical development and current utilization of this aquifer as a quality water source over many years has provided a basis for the economic development of this region. Management of the resource, however, has fallen far behind its utilization and users are faced by the prospect of both chronic long-term degradation of water quality at the source and local areas of acute contamination which threaten some water supplies.

Because the population and the industrial base which supports it are entirely dependent on this water source, an effective management program is to be developed and implemented as soon as practicable. The design of a Work Plan for that program has been accomplished and a consultant has been selected to undertake the first phases of the work.

The Ground Water Management Program work plan includes the following components:

A. Data Base Development
B. Aquifer Assessment
C. Management Option Survey
D. Management Program Development
E. Management Structure Design

At this time, the consultant has been authorized to undertake the first two components of this program.

In connection with this work, the consultant will need to gather some basic information on the quality and quantity of water available and utilized from the aquifer system. We would like to solicit your cooperation and assistance in this effort. Representatives of the consultant, Ms. Julie Weatherington-Rice and/or Mr. Henry Hunt will contact you in the next few weeks to discuss our data needs and to survey data format and availability. We hope that you or your designated representative will be able to provide the necessary assistance to them in pursuit of our objectives.

We have designed a format for information which we would like to obtain initially and would appreciate it if you would provide the needed data as soon as you can conveniently do so. If you wish, you may send this information directly to MVRPC, 117 S. Main Street, Suite 200, Dayton, Ohio 45402, or to (our consultant) Bennett & Williams, Inc., 2700 E. Dublin-Granville Road, Suite 550, Columbus, Ohio 43229, Attention: Mr. Hunt. If you have any questions about the information requested, please call Mr. Hunt or Ms. Weatherington-Rice at 614/882-9122 or contact this office.

We understand that some of the information requested may be regarded as confidential by your company. We would like to receive any information, including excerpts from reports, that can be released by your company. Our objective is to obtain general geologic and hydrogeologic information and to develop accurate estimates regarding the ground water withdrawals in the study area, without identifying specific sources.

The interest of this community in moving ahead with a ground water protection and management program is high and, as a consequence, we are actively preparing that program plan for completion within the next year. Whatever can be done within the scope of your resources to expedite and facilitate this program would be greatly appreciated.

Cordially,

Ronald G. Schmidt

Ronald G. Schmidt, Manager
Ground Water Management Program

RGS:gi

Enclosure

MIAMI VALLEY REGIONAL PLANNING COMMISSION
GROUND WATER MANAGEMENT PROGRAM

DATA SURVEY OUTLINE

The following outline represents the information that is requested as part of the survey for this project. We understand that some of the information requested may be regarded as confidential. Please provide whatever data can be released regarding general geologic and hydrogeologic conditions and ground water use at your facility. The quality and completeness of the information available has a direct relationship to the usability of the survey results. Your assistance in providing the information requested on this form as completely and accurately as possible will be greatly appreciated. If you have any questions, please contact Mr. Henry Hunt at Bennett and Williams.

Respondent: CHRYSLER CORP.

Contact: V.L. ALLEN Phone: (513) 224-2467

56'-11"

GROUND WATER USE 700 X 60 X 24 HRS/DAY 936 X 60 X 24

Daily Pumpage: 1.0 MGD Maximum Capacity: 1.3 MGD
Number of wells: 2 Active: 1 Standby: 1
Typical water table elevation that reflects:
a: background, or non-pumping, water levels: 22'-4" M.S.L.
b: water table under pumping conditions: 55'-11" M.S.L. 936 X 24

TOPOGRAPHIC SHEET

Include well logs, reports of drilling, results of pumping tests, well construction details, well location maps, historical ground water use, etc.

747.428
22.4
725.0

WATER QUALITY

Known problems with quality (such as hardness, iron, etc.):

Include results of current water quality analyses that would indicate representative background and/or "up-gradient" quality.

725.00
55'-11
669-1"
724.12

OTHER COMMENTS:

Thank you for your assitance in the survey data collection.

MIAMI VALLEY REGIONAL PLANNING COMMISSION
GROUND WATER MANAGEMENT PROGRAM

DATA SURVEY OUTLINE

The following outline represents the information that is requested as part of the survey for this project. We understand that some of the information requested may be regarded as confidential. Please provide whatever data can be released regarding general geologic and hydrogeologic conditions and ground water use at your facility. The quality and completeness of the information available has a direct relationship to the usability of the survey results. Your assistance in providing the information requested on this form as completely and accurately as possible will be greatly appreciated. If you have any questions, please contact Mr. Henry Hunt at Bennett and Williams.

Respondent: CHRYSLER CORPORATION, 1600 WEBSTER STREET, DAYTON, OHIO

Contact: VERNON L. ALLEN Phone: (513) 224-2467

GROUND WATER USE

Daily Pumpage: 1.0 MGD Maximum Capacity: 1.3 MGD
Number of wells: 2 Active: 1 Standby: 1
Typical water table elevation that reflects:
a: background, or non-pumping, water levels: 725.0 M.S.L.
b: water table under pumping conditions: 669.1 M.S.L.

Include well logs, reports of drilling, results of pumping tests, well construction details, well location maps, historical ground water use, etc.

WATER QUALITY

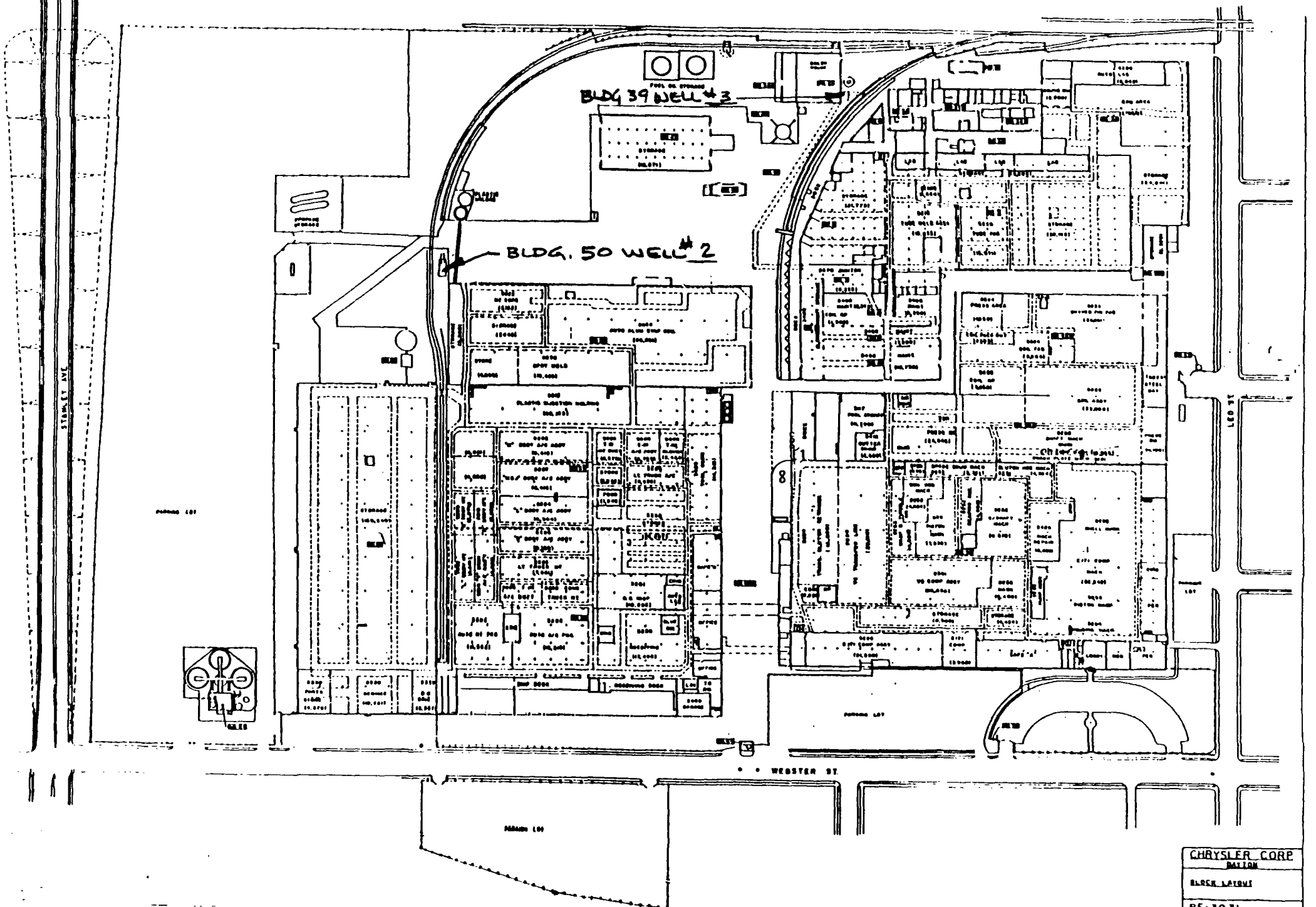
Known problems with quality (such as hardness, iron, etc.):
Hardness Well #2 = 420, Hardness Well #3 = 376
No recent test performed.

Include results of current water quality analyses that would indicate representative background and/or "up-gradient" quality.

OTHER COMMENTS:

Thank you for your assitance in the survey data collection.

VLA:vkr


BLDG 39 WELL #3
BLDG. 50 WELL #2
STANLEY AVE
WEBSTER ST
LEO ST
CHRYSLER CORP
DAYTON
BLOCK LAYOUT
PE-3931

WATER ANALYSIS REPORT

THE MOGUL CORPORATION, CLEVELAND, OHIO 44122

Job No. 8391

To: Chrysler Airtemp Div., Chrysler Corporation, Dayton, Ohio

Attention of: Title

Analysis Made 5/1/69

Covering Use of: in

Report Mailed 5/13/69

SAMPLE No.	[redacted]	No. 2	No. 3	No. 4	No. 5	No. 6
Total Hardness	[redacted]	440	384			
Calcium	[redacted]	240	192			
Magnesium	[redacted]	200	192			
Iron	[redacted]	0	0			
	[redacted]					
Silica	[redacted]	14	20			
Phosphate	[redacted]	0	0			
	[redacted]					
Phenol. Alkalinity (P)	[redacted]	0	0			
Total Alkalinity (M)	[redacted]	300	284			
Chloride	[redacted]	62	30			
Sulfate	[redacted]	176	140			
Total Dis'd Solids	[redacted]	720	540			
pH	[redacted]	7.2	7.3			
Sludge	[redacted]	none	none			
Oil	[redacted]					
Color	[redacted]	none	none			

Total Hardness, Calcium, Magnesium, Phenol. Alkalinity and Total Alkalinity reported as equivalent $CaCO_3$. Results above are expressed in parts per million. To convert to grains per gallon divide by 17.1.

SAMPLE No.	SAMPLE TAKEN FROM	DATE	TIME	MOGUL PRODUCT	DOSAGE
1	[redacted]				
2	#2 Well supply - Boiler House				
3	#3 Well - Bldg. 50 - 1000 gpm				
4					
5					
6					

Remarks and Recommendations:

RBJ/cp

Results to be
Picked Up ☐
Mailed ☐

Belmonte Park Laboratories
The Science Company

Amount Due ____
Paid ☐
Bill ☐

Water Potability Report

Report To: Name Chrysler
Address Leo St.
City, State, Zip Dayton, Ohio
Phone

Water Source: ☐ Municipal ☐ Semi-Private well ☐ Private well

(Signature) Collected By Wagnon
Date 12-22-86
Time: 1:56

Sampling Point: Boiler Room
Sampling Address:
County:
PWSID #:

Retest of Previous Sample: Yes ☐ No ☐

Ohio E.P.A. to receive results: Yes ☐ No ☐
____ N.E. Twinsburg ____ S.E. Logan ____ Central Columbus
____ N.W. Bowling Green ____ S.W. Dayton

THE ABOVE MUST BE FILLED IN OR SAMPLE WILL NOT BE TESTED. PRINT FIRMLY

Sample Number 5255

XXXXX Safe ____ Unsafe

____ Safety Not Determined

Date Received: 12-22-86

Date Reported: 12-23-86

Analyst: J. Fleming

MEMBRANE FILTRATION

<1 Coliforms/100 ml.

____ Other Organisms/100 ml.

CONFIRMATION

LST		BGBB	
24	48	24	48

Comments:

Reference: "Standard Methods for the Examination of Water and Wastewater"
E.P.A. Certification No. 837
Belmonte Park Laboratories
1415 Salem Avenue • Dayton, Ohio 45406 • 513/276-4181
No Samples Over 30 Hours Old Will Be Tested

Results to be
Picked Up ☐
Mailed ☐

Belmonte Park Laboratories
The Science Company

Amount Due ____
Paid ☐
Bill ☐

Water Potability Report

Report To: Name Chrysler
Address Leo St
City, State, Zip Dayton, Ohio
Phone

Water Source: ☐ Municipal ☐ Semi-Private well ☐ Private well

(Signature) Collected By: Waymon
Date: 12-22-86
Time: 1:32

Sampling Point: 250 Post B-C-3
Sampling Address:
County:
PWSID #:

Retest of Previous Sample: Yes ☐ No ☐

Ohio E.P.A. to receive results: Yes ☐ No ☐
____ N.E. Twinsburg ____ S.E. Logan ____ Central Columbus
____ N.W. Bowling Green ____ S.W. Dayton

THE ABOVE MUST BE FILLED IN OR SAMPLE WILL NOT BE TESTED. PRINT FIRMLY

Sample Number 5253

XXXX Safe ____ Unsafe

____ Safety Not Determined

Date Received: 12-22-86

Date Reported: 12-23-86

Analyst: J. Fleming

MEMBRANE FILTRATION

<1 Coliforms 100 ml.

____ Other Organisms/100 ml

CONFIRMATION

LST		BGBB	
24	48	24	48

Comments:

Reference: "Standard Methods for the Examination of Water and Wastewater"
E.P.A. Certification No. 837
Belmonte Park Laboratories
1415 Salem Avenue • Dayton, Ohio 45406 • 513/276-4181
No Samples Over 30 Hours Old Will Be Tested

CHRYSLER AIRTEMP CORPORATION
P.O. BOX 1205
DAYTON PLANT 1
DAYTON, OHIO 45401

BELMONTE PARK LABORATORIES
1415 SALEM AVENUE
DAYTON, OHIO 45406
(513)276-4181

REPORT TO: VERN ALLEN

LAB NO.10,328

REPORT ON: WATER SAMPLE 12/22/86--FOR NITRATES AS NO3-N & pH

DATE RECEIVED: 12/22/86

DATE REPORTED: 12/31/86

COLLECTED BY: WAYMON WILLIAMS

SAMPLE I.D.: BOILER ROOM

RESULTS/AS TESTED

NITRATE NITROGEN 0.1 MG/L

NORMAL: NOT TO EXCEED 10.0 MG/L

REFERENCE "STANDARD METHODS FOR THE EXAMINATION OF WATER AND WASTEWATER", 16TH EDITION.

James A. Elam

JAMES A. ELAM, B.L.D.
BIOANALYST DIRECTOR

J. M. Lake

J. MATTHEW LAKE
TECHNICAL DIRECTOR

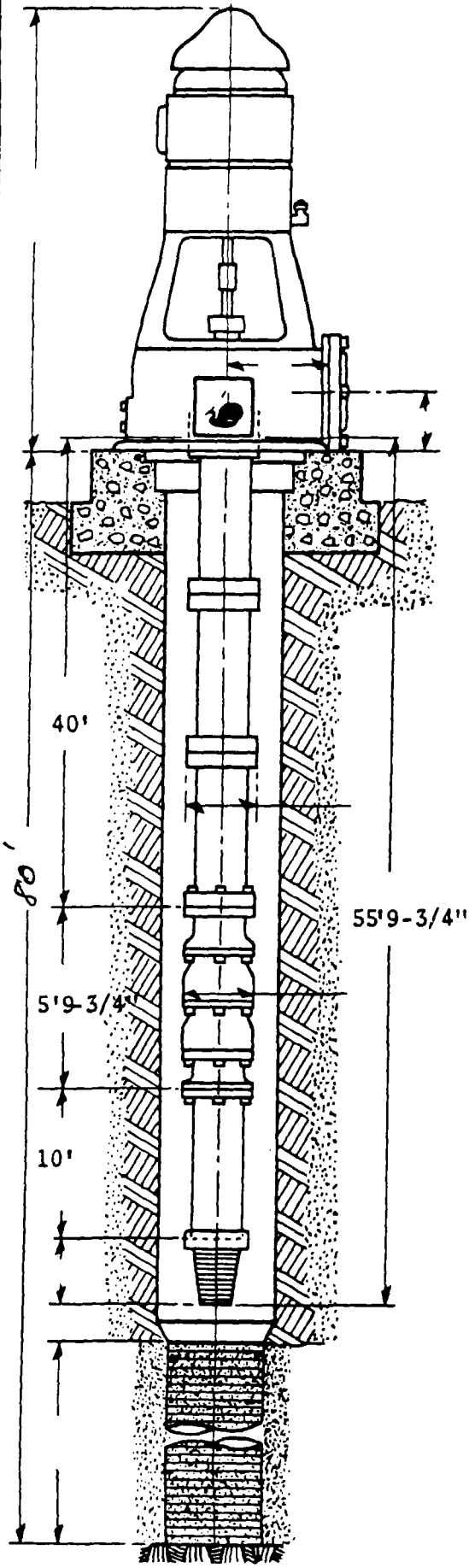
COMPLETE REPORT

CERTIFICATIONS
HIO EPA CERTIFICATION NUMBERS 836 & 837 • U.S. DEPT. OF AGRICULTURE LABORATORY CODE NO. 3988 • FOOD AND DRUG ADMINISTRATION REGISTRATION NUMBER 15223774 • SENIOR EMBER INSTITUTE OF FOOD TECHNOLOGISTS 0047733 • U.S. ATOMIC ENERGY COMMISSION REGISTRATION NUMBER 1550 • OHIO DEPT. OF HEALTH ALCOHOL TESTING APPROVAL PERMIT 9 • ASSOCIATION OFFICIAL ANALYTICAL CHEMISTS NO. VM42528001 • OHIO CERTIFICATE NO. 75 • FEDERAL DRUG ENFORCEMENT REGISTRATION NO PB244549 • AMERICAN BOARD OF OANALYSIS CERT. #D390.
L REPORTS ARE SUBMITTED AS CONFIDENTIAL PROPERTY TO OUR CLIENTS ANY RELEASE OF OUR REPORTS MUST MEET OUR APPROVAL AND OUR CLIENT'S CONSENT TO DO SO IN WRITING.

Belmonte Park Laboratories
The Science Company

MOODY'S OF DAYTON, INC.

P.O. BOX 123, MIAMISBURG, OH.



TURBINE PUMP INSTALLATION FOR:

CHRYSLER CORPORATION

WELL DESIGNATION NO. E 39

	SERIAL NUMBER
750	GALLONS PER MINUTE
225	TOTAL HEAD IN FEET
10"	5 STAGES
1770	MOTOR SPEED
55'9-3/4"	FEET OF SETTING
8	SIZE COLUMN
0	OIL TUBE
40'	LINE SHAFT
	10' SUCTION PIPE
--	H.P. ____ VOLT. ____ CURRENT ____
water	LUBRICATION
55'	FEET OF AIRLINE
9/28/83	DATE INSTALLED

12"	I.D. OF WELL
79'	FEET DEEP FROM FOUNDATION
89'	FEET DEEP FROM GRADE
20'	STRAINER LENGTH — SLOT ____
30'	STATIC LEVEL — DATE 9/29/83
	" " — "
	" " — "
	" " — "
1963	DATE DRILLED

PUMP REPAIRED — DATE 9/27/83

" " — "

" " — "

WELL ACID TREATED — DATE ____

" " " — "

COMMENTS —

Discharge 10' below grade

FORM TPI-762

LITHO IN U.S.A.

MOODY'S of Dayton, Inc.

Developers of
UNDERGROUND WATER SUPPLY
"Since 1885"

PRODUCTION TEST OF WELL

JOB # 34144

OWNER Chrysler Corporation CITY Dayton STATE Ohio

WELL NO. 39 LOCATION by water tower

MEASURED FROM GROUND LEVEL: TOTAL DEPTH 89' INSIDE DIA. 12" STANDING WATER LEVEL 30'

TYPE WELL: GRAVEL WALL ___ TUBULAR x ROCK ___ NEW ___ OLD x CLEANED x GRAVEL WALL DIA. ___

SCREEN: LENGTH 20' DIA. 2" SLOT SIZE var TYPE Cook DEPTH TO TOP 68'

ORIFICE SIZE 6 BY 4 WATER DISCHARGED 25' FEET FROM WELL INTO open

DATE	TIME	INCHES ON ORIFICE	GALLONS PER MINUTE	PUMPING LEVEL	DISCHARGE PRESSURE	REMARKS
10/24/83	7:37	shut-off	--	30'	170#	165#
	10:43	7"	371	48'	130#	130#
	10:44	7"	371	46'	130#	132# 59 Amps
	10:47	7"	371	46'	132#	131#
	10:50	13"	505.6	54'	100#	105#
	10:55	13"	505.6	54'	100#	105# 62 Amps
	10:57	24"	687	55'	45# **	57# 57 Amps 24-32
	11:10	24"	687	55'	45#	58# 57 Amps
	11:13	25"	701		48#	
	11:17	24"	687	55'	48#	58# 57 Amps
						** Broke suction at 42# to 40#
						Orifice at 27"
	Try and operate between 55-60 psi by throttling gate valve.					
						Air gauge reading 9' above discharge.
						Orifice reading 8' above discharge &
						20' away .
						Pumped into open.

Specialists in Geophysical Surveys
GAMMA RAY AND ELECTRIC LOGS
RESISTIVITY SURVEYS
AERIAL PHOTOGRAPHY STUDIES

Specialists in Piezometer Installations
PUMP SALES AND REPAIRS
WELL DRILLING
WELL CLEANING

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	10:57	24"	687	55'	45# **	57# 57 Amps 24-32
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9/29/83	10:48	closed	0	30'	160	
	10:51	7"	371	Broke suction		Could not get a reading on water
						level
	12:02	13.5	277.9	48'	138	
	12:10	13.5	277.9	48'	138	All measurements taken 9'10" below
	12:30	22	354.8	54'	130	grade.
	12:40	22"	354.8	54'	130	
						Plant has 90# line pressure.

MOODY'S of Dayton, Inc.

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UNDERGROUND WATER SUPPLY
"Since 1885"

PRODUCTION TEST OF WELL

JOB # 34144

OWNER Chrysler Corporation CITY Dayton STATE Ohio

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Specialists in Geophysical Surveys
GAMMA RAY AND ELECTRIC LOGS
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AERIAL PHOTOGRAPHY STUDIES

BY: DOUG JONES

Specialists in Piezometer Installations
PUMP SALES AND REPAIRS
WELL DRILLING
WELL CLEANING

FILE: BLDG. 39 WELL

CALGON
CORPORATION

SUBSIDIARY OF MERCK & CO., INC.

WATER MANAGEMENT DIVISION CALGON CORPORATION 4670 PADDOCK ROAD CINCINNATI, OHIO 45229 (513) 242-0161

June 11, 1975

Chrysler Corporation
Plant #1
5407 Dayton
Dayton, Ohio 45404

Attention: Carl Henry, Manager Maintenance & Service

Subject: Calgon Water Analyses Samples #L5685 thru L5688

Gentlemen:

Attached are our analyses for samples #L5685 through #L5688.

The two well water samples (#L5685 and #L5687) show that there is approximately 10.5% more hardness in the power plant well than there is in the building #50 well.

Our Calgon TG-10 determinations showed you were feeding 2.4 ppm and 3.3 ppm respectively. This is slightly low.

The boiler water sample (L5686) indicates protective conditions. A lower phosphate residual would be a way to make further improvement.

The condensate sample (#L5688) shows that you are producing good quality steam.

Very truly yours,

CALGON CORPORATION

Joseph A. Ivancic

Joseph A. Ivancic
Water Management Division

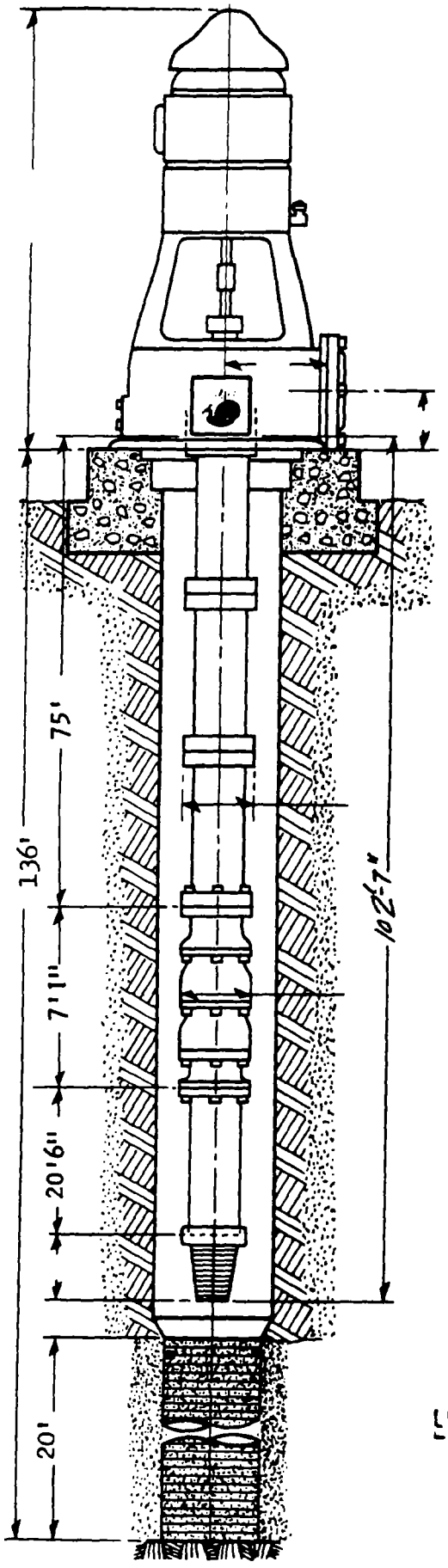
JAI/mp/att.
cc: J. Knapp
cc: H. C. Brush
cc: Thomas Sturr

SUBSIDIARY

PLANT Chrysler Corporation, Plant #1, 5407 Dayton, Dayton, Ohio 45404

LABORATORY NO	L5685	L5686	L5687	L5688
DATE SAMPLED	May, 1975	May, 1975	May, 1975	May, 1975
DESCRIPTION	Well Water Bldg. #50 Water white, very sl. turbid	#4 Boiler Water Water white, turbid	Well Water Bldg. 39 (Power Plant) Water white, clear	Condensate Water white, clear
	HALL	HALL	HALL	HALL
pH Value @ 25°C	7.7		7.7	6.5
TITRATIONS ml — A Reading	-		-	
MO Reading	17.5		18.8	0.1
B Reading		20.2		
Conductivity @ 77°F (micromhos/cm)	735 unneut.	4150 neut. 5545 unneut.	865 unneut.	4.4 unneut.
Dissolved Solids				
Suspended Solids	est. 5-10	est. 200-800	est. < 5	est. < 5
Total Solids				
CONCENTRATIONS IN mg/l — Hydroxide (OH)				
Carbonate (CO_3)				
Bicarbonate (HCO_3)	355	[illegible]	382	2
Carbon Dioxide (CO_2)				2
Ammonia (NH_3)				0.15
Chloride (Cl)	32	490	59	
Sulfate (SO_4)				
Silica (SiO_2)		38		
Nitrate (NO_3)				
Orthophosphate (PO_4)		84		
Polyphosphate (as PO_4)				
Organic Phosphorus (as PO_4)				
Hardness (as $CaCO_3$)	376		420	
Calcium (Ca)				
Magnesium (Mg)				
Sodium (Na)				
TG-10	2.4		3.3	
Iron (Fe)				
Copper (Cu)				
Manganese (Mn)				
Zinc (Zn)				

MOODY'S OF DAYTON, INC.
VANDALIA, OHIO



TURBINE PUMP INSTALLATION FOR:
Chrysler Dayton Plant 1

WELL DESIGNATION NO. 3

DEMING

T16586 SERIAL NUMBER
1000 GALLONS PER MINUTE
237 TOTAL HEAD IN FEET
12" 6 STAGES
1750 MOTOR SPEED
* 75 FEET OF SETTING
8" SIZE COLUMN
No OIL TUBE
1½" LINE SHAFT
20'6" 8" SUCTION PIPE
75 H.P. 460 VOLT. 60 CURRENT
water LUBRICATION
100 FEET OF AIRLINE
1-27-76 DATE INSTALLED

18" I.D. OF WELL
136 FEET DEEP FROM FOUNDATION
FEET DEEP FROM GRADE
STRAINER LENGTH — SLOT
11'4" STATIC LEVEL — DATE 1-27-76
" " — "
" " — "
" " — "
DATE DRILLED

PUMP REPAIRED — DATE 1-27-76
" " — " 7-31-70
" " — " 8-17-64

WELL ACID TREATED — DATE 1-27-76
" " " — " 7-31-70

COMMENTS —

Weather conditions did not permit a capacity test - Well was pumped off through a man hole.

RECEIVED
MAR 16 1976
T. Sturr
Dept. 3450

FORM TPI-762

LITHO IN U.S.A.

each 10' long. This column pipe is standard 8" with threaded sleeve couplings.

MOODY'S of Dayton, Inc.

Developers of
UNDERGROUND WATER SUPPLY
"Since 1885"

PRODUCTION TEST OF WELL

JOB # 45147

OWNER Chrysler Corporation CITY Dayton STATE Ohio

WELL NO. 3-Bldg#50 LOCATION Building #50

MEASURED FROM GROUND LEVEL: TOTAL DEPTH ____ INSIDE DIA. ____ STANDING WATER LEVEL 27'9"

TYPE WELL: GRAVEL WALL ____ TUBULAR ____ ROCK ____ NEW ____ OLD ____ CLEANED ____ GRAVEL WALL DIA. ____

SCREEN: LENGTH ____ DIA. ____ SLOT SIZE ____ TYPE ____ DEPTH TO TOP ____

ORIFICE SIZE ____ BY ____ WATER DISCHARGED ____ FEET FROM WELL INTO ____

DATE	TIME	INCHES ON ORIFICE	GALLONS PER MINUTE	PUMPING LEVEL	DISCHARGE PRESSURE	REMARKS
9/24/85	10:50	--	--	--	--	Static Level
		--	--	27'9"	137	Shut-off head
	10:55	8	361	48'10⅓"	114	
	11:00	8	361	48'10½"	114	NOTE: P.L. taken at ground level
	11:05	17	510	60'2"	105	Pressures measured down in pit 10'
	11:10	17	510	60'9"	105	below ground
	11:15	43	815	85'8"	62	
	11:20	43	815	86'1"	62	
	11:25	65	981	102'5"	24	Open valve
	11:30	65	981	102'7⅓"	24	
						Original Design: 1000 GPM @ 237'/

MOODY'S INC

Specialists in Geophysical Surveys
GAMMA RAY AND ELECTRIC LOGS
RESISTIVITY SURVEYS
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PUMP SALES AND REPAIRS
WELL DRILLING
WELL CLEANING

The Layne Ohio Company
A Division of
LAYNE WESTERN COMPANY, INC.
WATER SUPPLY SERVICES
WATER WELLS • LAYNE PUMPS • TEST DRILLING • WATER TREATMENT EQUIPMENT
4921 Vulcan Avenue • Columbus, Ohio 43228-9648 • (614) 876-1195

January 28, 1986

Mr. Vern Allen
Chrysler Corporation
1600 Webster St.
Dayton, Ohio 45404

Ref: No. 3 Water Well and Pump, Building 50

Dear Vern:

As you are aware, the Layne-Ohio Company has recently completed the redevelopment of water well No. 3 and repairs to the pump. For your files, we have attached two copies each of both T.V. camera survey logs, well test data sheet, and pump installation form.

Before starting the redevelopment program, a closed circuit underwater television inspection was conducted inside of the well. Heavy deposits were seen on the casing from approximately 94 feet to the top of the screen at approximately 114 feet. Moderate deposits were found on the entire length of screen. After cleaning, another T.V. survey was conducted which found the casing and screen to be clean and free of deposits.

Following installation of the permanent pump, a flow test was conducted to demonstrate the well's capacity. As shown on the well test data sheet, the well was tested at various rates up to 1,096 gallons per minute. At this rate, the well experienced a drawdown of 40'8" from the non-pumping level of 22'4" to a pumping level of 63'. As shown, the well now has an average specific capacity of 29.4 gallons per minute per foot of drawdown. Specific capacity is a term used in expressing the productivity of a well and is defined as the gallons per minute produced by a pumping well per foot of drawdown. According to the flow test conducted on the well on September 24, 1985, before cleaning, the well had a specific capacity of 13.1 when producing 981 gallons per minute. Therefore, the capacity of the well has more than doubled and shows the redevelopment process was successful.

When we picked up the pump, from another contractor, we received only the discharge head, suction pipe, and the 6 stage bowl assembly and 5 impellers. It was necessary to bore out all 6 stages, suction nozzle, and discharge nozzle and make and install 8 custom oversized bronze bushings. A complete new 70' column setting was furnished and installed. All of the column pipe was sandblasted and received two coats of an epoxy coating. The

vertical hollow shaft motor was serviced by your personnel. After installation, the crew foreman noted the pump runs smooth.

If you have any questions on the above, or if we may be of additional service, please feel free to call at any time. Thank you for your confidence in the Layne-Ohio Company by allowing us to be of service on your water supply needs.

Very truly yours,

THE LAYNE-OHIO COMPANY

C. L. Layne
Sales Manager

CLL/slf
Enclosures

T.V. CAMERA SURVEY

Date 1-10-86

Customer Chrysler

Job No. L-2533 Well No. 3 Bldg. 50 S.W.L. 22.3

Location:

County Montgomery City Dayton State Ohio

Sec. Twp. Rge.

Tape Made Yes ☒ No ☐ Tape File No.

Was Well Backflushed? Yes ☒ No ☐

How Long Backflushed? 5 gpm, 2 weeks

Tape Length In ~~Minutes~~ Feet 365

Brief Well Description Tubular well after cleaning. Start with bottom of light head even with top of pit.

(See Well Drawing "Sketch" On Back)

DEPTH	DESCRIPTION
0	Start
10.5	Top of well casing
22.3	Static water level
54.2	Casing joint
75.5	Casing joint
86.1	Casing joint
96.0	Casing joint
115.0	Top of screen - clean to bottom
125.8	Screen joint
135.6	Bottom - firm

Technician C. L. Layne

LW-275

T.V. CAMERA SURVEY

Date 12-9-85

Customer Chrysler Corporation

Job No. L-2558 Well No. 3 - Bldg. 50 S.W.L. 22.8'

Location:

County Montgomery City Dayton State Ohio

Sec. Twp. Rge.

Tape Made Yes ☒ No ☐ Tape File No.

Was Well Backflushed? Yes ☒ No ☐

How Long Backflushed? 4 days @ 5gpm

Tape Length In ~~Minutes~~ Feet 433

Brief Well Description 18" tubular well. Start with light head even with top of concrete slab. Top of well in pit.

(See Well Drawing "Sketch" On Back)

DEPTH	DESCRIPTION
0	Start
10.7'	Top of casing
22.3'	Casing joint
22.8'	Static water level
32.8'	Casing joint
43.1'	Casing joint
54.5'	Casing joint
64.8'	Casing joint
71.2'	Casing joint
75.5'	Casing joint
86.3'	Casing joint
94.0'	Heavy deposits on casing to top of screen
114.5'	Top of screen - moderate deposits to bottom
125.8'	Screen joint
133.6'	Bottom - Soft

Technician C. L. Layne

LW-275

WELL TEST DATA SHEET

The Layne Ohio Company

A Division of
LAYNE-WESTERN COMPANY, INC.

WATER SUPPLY SERVICES

WATER WELLS • LAYNE PUMPS • TEST DRILLING • WATER TREATMENT EQUIPMENT

1100 West Town Street • Columbus, Ohio 43222 • (614) 228-3803

Job Chrysler Corp. Well No. 3, Bldg.50 Date Tested 1-20-86

Location Dayton, Ohio Tested By S. Colter

Dia. of Well 18" Tubular Pump Used: Customer's Well Pump

Depth of Well 136 Driver 75 H.P. U.S.

Water Levels by: Electric Dropline Column and Shaft 8"x1½" - 70'

~~XXXXXXXXXX~~ Bowl 12" 6-stage - 5 impellers

Non-Pumping Level 22'4" Manufacturer Deming

Orifice Size 8"x6" Serial No. T-16586

Time	Piezometer Reading (in.)	G.P.M.	Air Gauge Reading (feet)	Pumping Level	Drawdown	Disch. Pressure Lbs.	Disch. Pressure Feet	Total Pumping Head	*S.C. REMARKS
		0	Closed	Valve		123	284	306	
	6.5	403		35	12'8"	100	231	266	31.8
	17	653		43'5"	21'1"	80	185	228	31.0
	22	742		47'4"	25'	60	139	186	29.7
	27.5	830		50'9"	28'5"	50	116	166	29.2
	35	936		55'11"	33'7"	20	46	102	27.9
	48	1096		63'	40'8"	0	0	63	26.9
								Avg. =	29.4

Note: Water level measurements taken from top of well pit cover.

*S.C. = Specific Capacity

Layne-Western Company, Inc.

PUMP INSTALLATION

JOB NAME Chrysler, Corp.

Address

City, State Dayton, Ohio

DATE 1 20 86 Job Completion
Month Day Year

Deming
PUMP NO. T-16586 ~~Oil~~-Water Lube ~~New~~ Repair

Pump Trouble Repair & Clean Well

PUMP SIZE

	DIAMETER		LENGTHS
Discharge	8"	Above ~~Below~~	X
Column	8"	Screw ~~Flange~~	10'
Tubing	—		
Shaft	1 1/2	Stainless Carbon	10'

Column setting to bowl 70 ft.

BOWL

Diameter 12 Shaft Diameter 1 1/2

Type Deming Open Stages 6
Only 5 impellers

Cast Iron ~~or Bronze~~

Suction 8" " Diameter 20 Ft. Long

Special Paint or Coating on: Zinc Sleeves in:

Column Plasite epoxy in grout

~~Tubing~~

MOTOR OR GEAR DRIVE

Make U. S. HP 75

Speed 1800 Volts 220/460

Or Gear Drive Ratio Standard Combination

Frame Size 445 P Non-Reverse — ~~Yes~~ No

Running Amps. 90

Running Volts

Serial No. 969106

WELL

No. 3 Year Drilled

Location Building 50

Diameter 18" Depth 136

Measured from top of Pit ~~" diameter~~ casing which is 9+ ~~feet above~~ ground

Tape to Water 22' 4"

Air Line Length 70' A.L. Material plastic

Static Gage Static Level

Pumping Gage Pumping Level

Discharge Pressure Feet when pumping into System

INSTALLER Sam Colter

Rig Used Smeal & Prentice

Foreman Hours to Rig Up To Pull

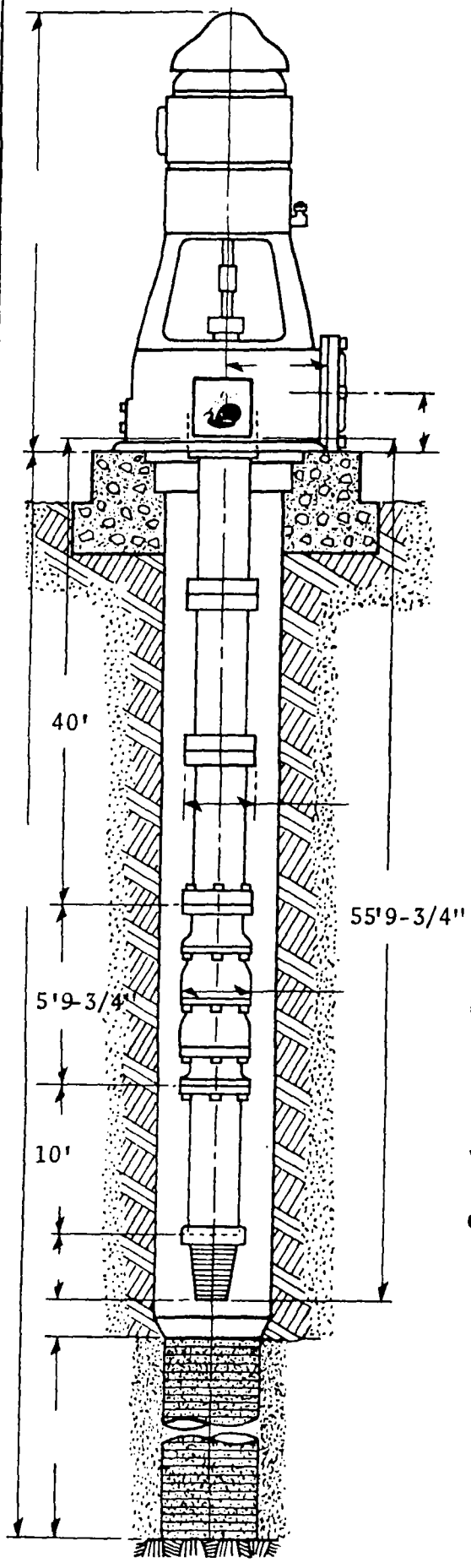
Inspect Repair To Set

PUMP REPAIR

CONDITION OF PUMP WHEN PULLED	NEW PARTS INSTALLED
Column None	Column 70' - 8"
Tubing —	Tubing —
Shafting None	Shafting 70' - 1 1/2"
Bowl Bushings bad only 5 impellers	Bowl
Suction fair	Suction
MACHINE WORK bore castings & install custom bushings	~~1. DRAIN PORTS OPEN~~ Yes No 2. CHLORINATE WELL (Yes) No 3. PUMP RUNS Smooth 4. ALIGN PUMP HEAD WITH DIAL INDICATOR (Yes) No 5. GROUTED HEAD-BASE PLATE Yes (No)

MOODY'S OF DAYTON, INC.

P.O. BOX 123, MIAMISBURG, OH.



TURBINE PUMP INSTALLATION FOR:

CHRYSLER CORPORATION

WELL DESIGNATION NO. 39

	SERIAL NUMBER
750	GALLONS PER MINUTE
225	TOTAL HEAD IN FEET
10"	5 STAGES
1770	MOTOR SPEED
55'9-3/4"	FEET OF SETTING
8	SIZE COLUMN
0	OIL TUBE
40'	LINE SHAFT
	10' SUCTION PIPE
--	H.P. ____ VOLT. ____ CURRENT ____
water	LUBRICATION
55'	FEET OF AIRLINE
9/28/83	DATE INSTALLED

12"	I.D. OF WELL
79'	FEET DEEP FROM FOUNDATION
89'	FEET DEEP FROM GRADE
20'	STRAINER LENGTH — SLOT ____
30'	STATIC LEVEL — DATE 9/29/83
	" " — "
	" " — "
	" " — "
1963	DATE DRILLED

PUMP REPAIRED — DATE 9/27/83

" " — "

" " — "

WELL ACID TREATED — DATE ____

" " " — "

COMMENTS —

Discharge 10' below grade

FORM TPI-782

LITHO IN U.S.A.

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SCREEN: LENGTH 20' DIA. 2" SLOT SIZE var TYPE Cook DEPTH TO TOP 68'

ORIFICE SIZE 6 BY 4 WATER DISCHARGED 25' FEET FROM WELL INTO open

DATE	TIME	INCHES ON ORIFICE	GALLONS PER MINUTE	PUMPING LEVEL	DISCHARGE PRESSURE	REMARKS
10/24/83	7:37	shut-off	--	30'	170#	165#
	10:43	7"	371	48'	130#	130#
	10:44	7"	371	46'	130#	132# 59 Amps
	10:47	7"	371	46'	132#	131#
	10:50	13"	505.6	54'	100#	105#
	10:55	13"	505.6	54'	100#	105# 62 Amps
	10:57	24"	687	55'	45# **	57# 57 Amps 24-32
	11:10	24"	687	55'	45#	58# 57 Amps
	11:13	25"	701		48#	
	11:17	24"	687	55'	48#	58# 57 Amps
						** Broke suction at 42# to 40#
						Orifice at 27"
	Try and operate between 55-60 psi by throttling gate valve.					
						Air gauge reading 9' above discharge.
						Orifice reading 8' above discharge &
						20' away .
						Pumped into open.

Specialists in Geophysical Surveys
GAMMA RAY AND ELECTRIC LOGS
RESISTIVITY SURVEYS
AERIAL PHOTOGRAPHY STUDIES

Specialists in Piezometer Installations
PUMP SALES AND REPAIRS
WELL DRILLING
WELL CLEANING

MOODY'S of Dayton, Inc.

Developers of
UNDERGROUND WATER SUPPLY
"Since 1885"

PRODUCTION TEST OF WELL

JOB # 34144

OWNER Chrysler Corporation CITY Dayton STATE Ohio

WELL NO. 39 LOCATION by water tower

MEASURED FROM GROUND LEVEL: TOTAL DEPTH 89' INSIDE DIA. 12" STANDING WATER LEVEL 30'

TYPE WELL: GRAVEL WALL ___ TUBULAR x ROCK ___ NEW ___ OLD x CLEANED x GRAVEL WALL DIA. ___

SCREEN: LENGTH 20' DIA. 2" SLOT SIZE var TYPE Cook DEPTH TO TOP 68'

ORIFICE SIZE 6 BY 4 WATER DISCHARGED 25' FEET FROM WELL INTO open

DATE	TIME	INCHES ON ORIFICE	GALLONS PER MINUTE	PUMPING LEVEL	DISCHARGE PRESSURE	REMARKS
10/24/83	7:37	shut-off	--	30'	170#	165#
	10:43	7"	371	48'	130#	130#
	10:44	7"	371	46'	130#	132# 59 Amps
	10:47	7"	371	46'	132#	131#
	10:50	13"	505.6	54'	100#	105#
	10:55	13"	505.6	54'	100#	105# 62 Amps
	10:57	24"	687	55'	45# **	57# 57 Amps 24-32
	11:10	24"	687	55'	45#	58# 57 Amps
	11:13	25"	701		48#	
	11:17	24"	687	55'	48#	58# 57 Amps
						** Broke suction at 42# to 40#
						Orifice at 27"
	Try and operate between 55-60 psi by throttling gate valve.					
						Air gauge reading 9' above discharge.
						Orifice reading 8' above discharge &
						20' away .
						Pumped into open.

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MOODY'S of Dayton, Inc.

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PRODUCTION TEST OF WELL

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OWNER Chrysler Corporation CITY Dayton STATE Ohio

WELL NO. 39 LOCATION by water tower

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TYPE WELL: GRAVEL WALL ___ TUBULAR x ROCK ___ NEW ___ OLD x CLEANED x GRAVEL WALL DIA. ___

SCREEN: LENGTH 20' DIA. 2" SLOT SIZE var. TYPE Cook DEPTH TO TOP 68'

ORIFICE SIZE 6 BY 4 WATER DISCHARGED 25' FEET FROM WELL INTO open

DATE	TIME	INCHES ON ORIFICE	GALLONS PER MINUTE	PUMPING LEVEL	DISCHARGE PRESSURE	REMARKS
9/29/83	10:48	closed	0	30'	160	
	10:51	7"	371	Broke suction		Could not get a reading on water
						level
	12:02	13.5	277.9	48'	138	
	12:10	13.5	277.9	48'	138	All measurements taken 9'10" below
	12:30	22	354.8	54'	130	grade.
	12:40	22"	354.8	54'	130	
						Plant has 90# line pressure.

MOODY'S, INC.

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RESISTIVITY SURVEYS
AERIAL PHOTOGRAPHY STUDIES

BY: DOUG JONES

Specialists in Piezometer Installations
PUMP SALES AND REPAIRS
WELL DRILLING
WELL CLEANING

MOODY'S of Dayton, Inc.

Developers of
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"Since 1885"

PRODUCTION TEST OF WELL

JOB # 34144

OWNER Chrysler Corporation CITY Dayton STATE Ohio

WELL NO. 39 LOCATION by water tower

MEASURED FROM GROUND LEVEL: TOTAL DEPTH 89' INSIDE DIA. 12" STANDING WATER LEVEL 30'

TYPE WELL: GRAVEL WALL ___ TUBULAR x ROCK ___ NEW ___ OLD x CLEANED x GRAVEL WALL DIA. ___

SCREEN: LENGTH 20' DIA. 2" SLOT SIZE var. TYPE Cook DEPTH TO TOP 68'

ORIFICE SIZE 6 BY 4 WATER DISCHARGED 25' FEET FROM WELL INTO open

DATE	TIME	INCHES ON ORIFICE	GALLONS PER MINUTE	PUMPING LEVEL	DISCHARGE PRESSURE	REMARKS
9/29/83	10:48	closed	0	30'	160	
	10:51	7"	371	Broke suction		Could not get a reading on water
						level
	12:02	13.5	277.9	48'	138	
	12:10	13.5	277.9	48'	138	All measurements taken 9'10" below
	12:30	22	354.8	54'	130	grade.
	12:40	22"	354.8	54'	130	
						Plant has 90# line pressure.

FILE: BLDG. 39 WELL

CALGON
CORPORATION
SUBSIDIARY OF MERCK & CO., INC.

WATER MANAGEMENT DIVISION CALGON CORPORATION 4670 PADDOCK ROAD CINCINNATI, OHIO 45229 (513) 242-0161

June 11, 1975

Chrysler Corporation
Plant #1
5407 Dayton
Dayton, Ohio 45404

Attention: Carl Henry, Manager Maintenance & Service

Subject: Calgon Water Analyses Samples #L5685 thru L5688

Gentlemen:

Attached are our analyses for samples #L5685 through #L5688.

The two well water samples (#L5685 and #L5687) show that there is approximately 10.5% more hardness in the power plant well than there is in the building #50 well.

Our Calgon TG-10 determinations showed you were feeding 2.4 ppm and 3.3 ppm respectively. This is slightly low.

The boiler water sample (L5686) indicates protective conditions. A lower phosphate residual would be a way to make further improvement.

The condensate sample (#L5688) shows that you are producing good quality steam.

Very truly yours,

CALGON CORPORATION

Joseph A. Ivancic

Joseph A. Ivancic
Water Management Division

JAI/mp/att.
cc: J. Knapp
cc: H. C. Brush
cc: Thomas Sturr

PLANT Chrysler Corporation, Plant #1, 5407 Dayton, Dayton, Ohio 45404

LABORATORY NO	L5685	L5686	L5687	L5688
DATE SAMPLED	May, 1975	May, 1975	May, 1975	May, 1975
DESCRIPTION	Well Water Bldg. #50 Water white, very sl. turbid	#4 Boiler Water Water white, turbid	Well Water Bldg. 39 (Power Plant) Water white, clear	Condensate Water white, clear
	HALL	HALL	HALL	HALL
pH Value @ 25°C	7.7		7.7	6.5
TITRATIONS ml — A Reading	-		-	
MO Reading	17.5		18.8	0.1
B Reading		20.2		
Conductivity @ 77°F (micromhos/cm)	735 unneut.	4150 neut. 5545 unneut.	865 unneut.	4.4 unneut.
Dissolved Solids				
Suspended Solids	est. 5-10	est. 200-800	est. < 5	est. < 5
Total Solids				
CONCENTRATIONS IN mg/l — Hydroxide (OH)				
Carbonate (CO_3)				
Bicarbonate (HCO_3)	355	~~XX~~	382	2
Carbon Dioxide (CO_2)				2
Ammonia (NH_3)				0.15
Chloride (Cl)	32	490	59	
Sulfate (SO_4)				
Silica (SiO_2)		38		
Nitrate (NO_3)				
Orthophosphate (PO_4)		84		
Polyphosphate (as PO_4)				
Organic Phosphorus (as PO_4)				
Hardness (as $CaCO_3$)	376		420	
Calcium (Ca)				
Magnesium (Mg)				
Sodium (Na)				
TG-10	2.4		3.3	
Iron (Fe)				
Copper (Cu)				
Manganese (Mn)				
Zinc (Zn)				

MOODY'S of Dayton, Inc.

Developers of
UNDERGROUND WATER SUPPLY
"Since 1885"

PRODUCTION TEST OF WELL

JOB # 45147

OWNER Chrysler Corporation CITY Dayton STATE Ohio

WELL NO. 3-Bldg#50 LOCATION Building #50

MEASURED FROM GROUND LEVEL: TOTAL DEPTH ____ INSIDE DIA. ____ STANDING WATER LEVEL 27'9"

TYPE WELL: GRAVEL WALL ____ TUBULAR ____ ROCK ____ NEW ____ OLD ____ CLEANED ____ GRAVEL WALL DIA. ____

SCREEN: LENGTH ____ DIA. ____ SLOT SIZE ____ TYPE ____ DEPTH TO TOP ____

ORIFICE SIZE ____ BY ____ WATER DISCHARGED ____ FEET FROM WELL INTO ____

DATE	TIME	INCHES ON ORIFICE	GALLONS PER MINUTE	PUMPING LEVEL	DISCHARGE PRESSURE	REMARKS
9/24/85	10:50	--	--	--	--	Static Level
		--	--	27'9"	137	Shut-off head
	10:55	8	361	48'10½"	114	
	11:00	8	361	48'10½"	114	NOTE: P.L. taken at ground level
	11:05	17	510	60'2"	105	Pressures measured down in pit 10'
	11:10	17	510	60'9"	105	below ground
	11:15	43	815	85'8"	62	
	11:20	43	815	86'1"	62	
	11:25	65	981	102'5"	24	Open valve
	11:30	65	981	102'7½"	24	
						Original Design: 1000 GPM @ 237'/

MOODY'S INC.

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PUMP SALES AND REPAIRS
WELL DRILLING
WELL CLEANING

#7 — BLDG-40

G. M. BAKER & SON, INC.

Developers of
UNDERGROUND WATER SUPPLY
"Since 1885"
DEEP WELL TURBINE PUMPS
JOHNSON WELL SCREENS

145 Hosack Street
Telephone 443-3898
Columbus, Ohio 43207 . . . (Home Office)

Consolidated Equipment Company
2211 S. Dixie Drive
Telephone 298-2189
Dayton, Ohio . . . (Dayton Representative)

March 26, 1969

Chrysler Corporation
Airtemp Dayton Plant
P. O. Box 1037
Dayton, Ohio 45401

Attention: Mr. Thomas Sturr
Foreman, Boiler House

Gentlemen:

Attached is a copy of a letter written to Mr. T. G. Wingate covering the maintenance work which we completed on one of your wells last fall.

For your further information the Peerless pump bowl section which was furnished on this job is referred to as Peerless, 10LB, 4-stage pump, per Specification 2625600.

If we can help in any other way, please feel free to call on us.

Yours very truly,

G. M. BAKER & SON, INC.

W. H. Boger

W. H. Boger BB
President

WHB:ek
Attch.

MEMBER
GROUND WATER INSTITUTE
GWI

II 1. WELL
BLDG. 40

November 15, 1968

Chrysler Corporation
Airtemp Dayton Plant
P. O. Box 1037
Dayton, Ohio 45401

Attention: Mr. T. G. Wingate

Gentlemen:

We refer in this letter to work recently completed by this firm covering the repair of your Deming Deep Well Turbine Pump and motor and the cleaning of the well.

Enclosed you will find a dimensional drawing showing that we installed 40' of new 6" x 1-3/16" column and a new 10", 4-stage bowl section rated for a production of 500 GPM against 171' total head. The total setting below the base is 44' 1-5/16".

The motor bearings were replaced and the windings were re-enameled and baked.

We also enclose a pump performance curve giving all pertinent information of the Peerless Pump.

The well was cleaned chemically, using hydroxyacetic acid. As you know, it is impossible to measure production from this well; however, we did note that quite a lot of blockage materials were removed during the cleaning operations and at the completion of the work the pump did not break suction while pumping in to the drainage sump.

We wish to thank you for your cooperation in doing this work, and if we may give you any further information please let us know.

Yours very truly,

G. M. BAKER & SON, INC.

W. H. Boger, Jr.

B,JR.:ek
Encls.

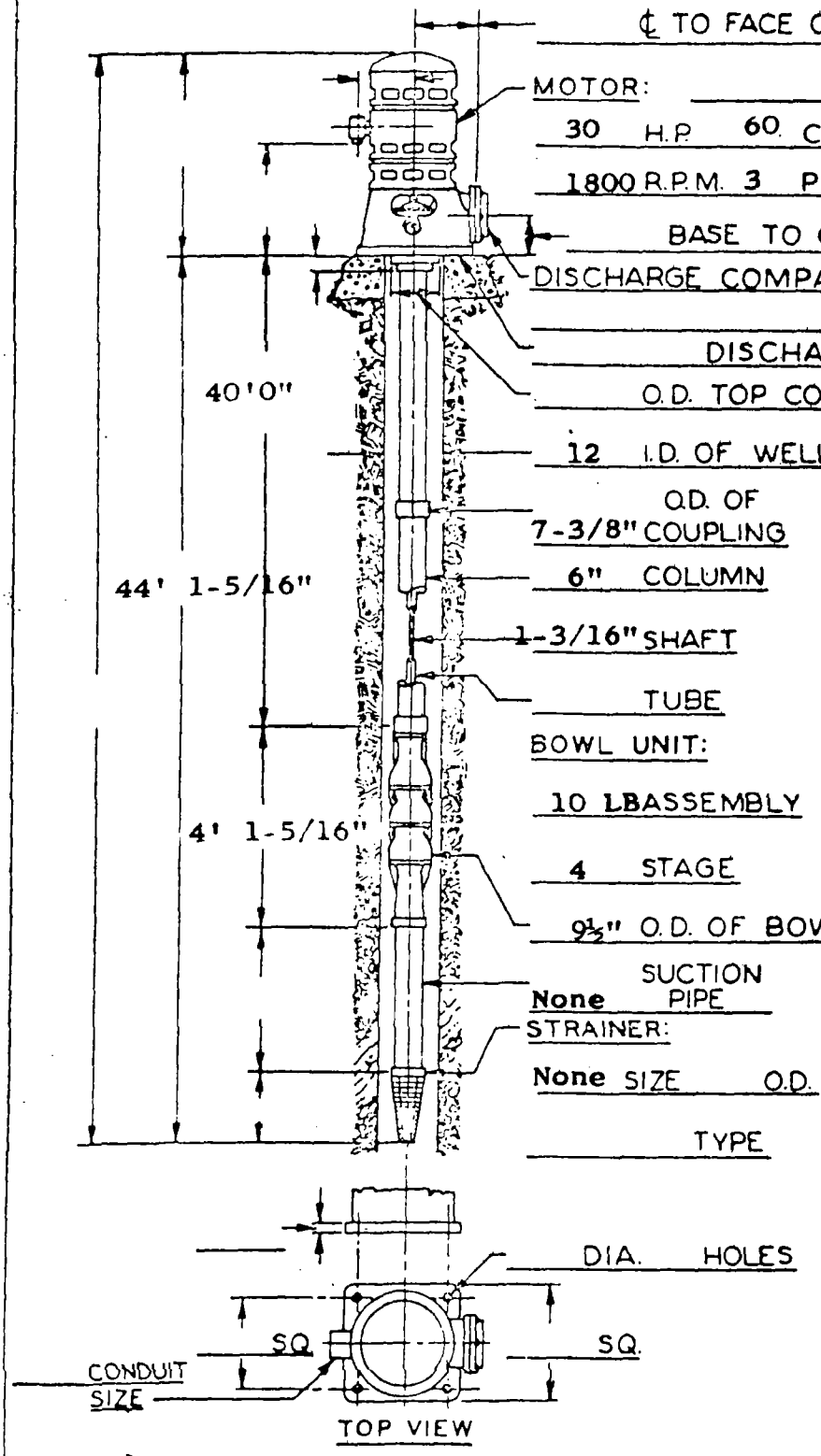
#1 WELL BLDG. 40

FORM NO. 2829002

PEERLESS PUMP

OLS

SURFACE DISCHARGE



℄ TO FACE OF FLANGE

MOTOR: MFR. TYPE

30 H.P. 60 CY. 220/440 OLTS

1800 R.P.M. 3 PH. FRAME

BASE TO ℄ OF DISCHARGE

DISCHARGE COMPANION FLANGE FOR:

DISCHARGE HEAD

O.D. TOP COL. FLANGE

12 I.D. OF WELL

O.D. OF 7-3/8" COUPLING

6" COLUMN

1-3/16" SHAFT

TUBE

BOWL UNIT:

10 LB ASSEMBLY

4 STAGE

9½" O.D. OF BOWLS

SUCTION PIPE None

STRAINER:

None SIZE O.D.

TYPE

DIA. HOLES

PUMP RATING

G.P.M. 500

FT. FIELD HD. 171

S.O. NO.

SOLD TO: CHRYSLER CORP. AIRTEMP DIVISION

ORDER NO.

USER:

ITEM NO.

PUMP IDENTIFICATION:

THIS CERTIFIED PRINT

☐ FOR APPROVAL

BY _____ DATE _____

☐ FOR CONSTRUCTION

BY _____ DATE _____

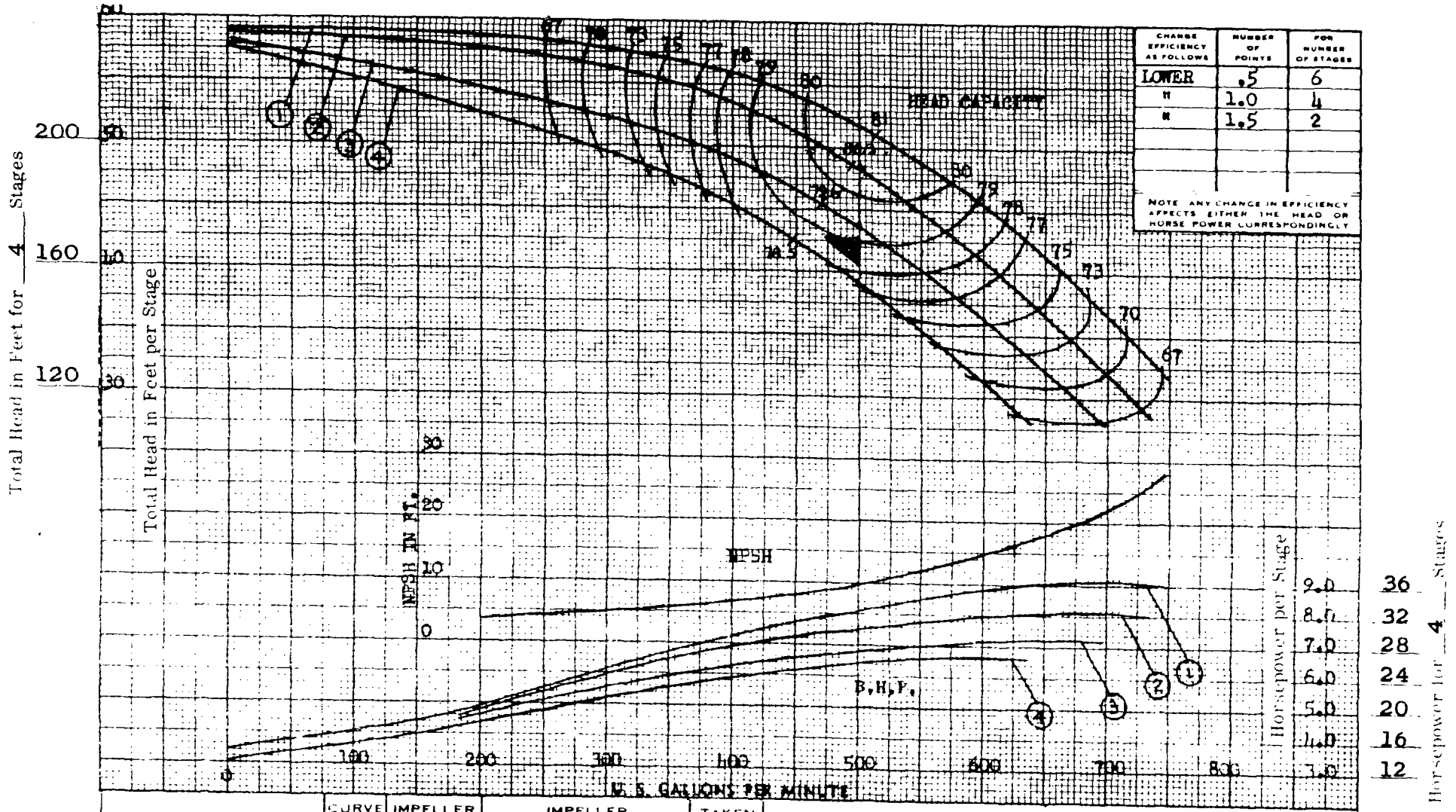
HYDRODYNAMICS DIVISION

PEERLESS PUMP

Los Angeles 31, Calif. · Indianapolis 8 Ind

DRN. BY: CHK'D BY: DATE:

PUMP NO.



CHANGE EFFICIENCY AS FOLLOWS	NUMBER OF POINTS	FOR NUMBER OF STAGES
LOWER	.5	6
"	1.0	4
"	1.5	2

NOTE ANY CHANGE IN EFFICIENCY AFFECTS EITHER THE HEAD OR HORSE POWER CORRESPONDINGLY

HYDRAULIC PERFORMANCE WARRANTY	CURVE NO.	IMPELLER NO	IMPELLER DIA.	TAKEN FROM
Guaranteed at designated point only, and contingent on:	1	2625033	7½"	41261
Proper flow to pump suction	2	2625033	7 3/16" x 7½"	41307
Proper submergence	3	2625033	6 7/8" x 7½"	41375
Fluid free of gas, air & abrasives	4	2625033	6 9/16" x 7½"	
Proper lateral setting of impeller				

Customer: CHRYSLER CORPORATION
AIRTEMP DIVISION -DAYTON, OHIO
Item No:
Peerless Ref. No:

Laboratory Performance BOWL 2625030 CIE

SIZE 10 LB RPM 1760 CURVE 2842217

PUMP DESCRIPTION: Driver 30 HP VHS; Head CI; Column 6" x 1-3/16"

GUARANTEED FIELD PERFORMANCE: Capacity 500 gpm; Head 171 ft; Eff 78.5 %; BHP 27.5

Inter Company Correspondence

		File Code	Date	
		31.74	10/2/75	
To—Name & Department		Division	Plant/Office	CIMS Number
P. Heim, Jr.	Plant Engineering	GMD	Dayton	482-01-14
From—Name & Department		Division	Plant/Office	CIMS Number
H. P. Pack	Plant Protection	GMD	Dayton	482-02-01

Subject:

POWER HOUSE WATER SUPPLY:

As you are aware, the infrequent usage of the fire protection water supply by the power house necessitates our turning off the fire pumps at this Plant.

Due to the serious fire potential of plastics + their extensive use and storage at this Plant, it is necessary to have this fire pump on automatic operational status at all times.

Please accept this as a formal request to pursue activities required to provide an alternate water supply for the power house that is separate from the Plant's water supply for the fire protection syste

This subject is a matter of concern to both the Corporate Fire Protection office and the insurance carrier as well as the writer.

Please advise if I can be of any assistance concerning subject matter.

Tom — Would like to discuss this.

H. P. Pack
Chief - Plant Protection

cc W. W. Humen
W. A. Wisniewski
J. L. McCarthy
File 31.74

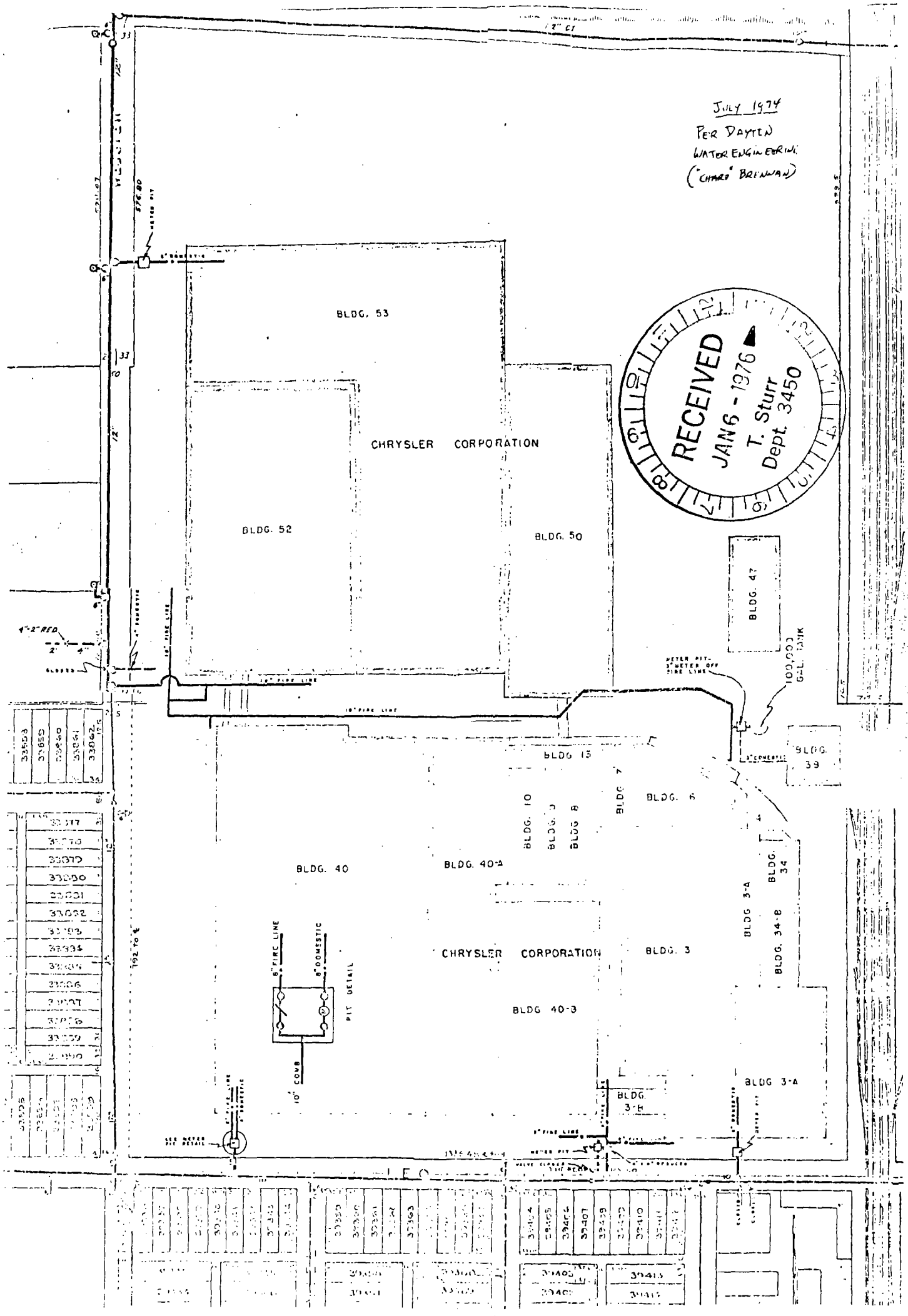
RECEIVED
OCT 7 - 1975
T. Sturr
Dept. [illegible]

Blr Ha City Water Service

10-9-75-
Per H. Pack's letter of 10-2-75, I discussed the matter with Paul Heim after having canvassed the factory buildings and building prints with Norman Culver. Shortest possible connection between well and city water is at SW corner of Bldg 40. Both appear to be 8" lines, though the only bldg print available did not show either one (showed fire line from city water only).

I recommended a setup using motorized valve controlled by Mercoid switch with a low voltage alarm wire (can use without conduit) going to Webster St. guard shack.

Paul said it would have to be coordinated thru Bill Marsh as to electrical components, and said he would get back with me if money could be found to do the job.


JULY 1974
PER DAYTON
WATER ENGINEERING
("CHARD" BRENNAN)
RECEIVED
JAN 6 - 1976
T. Sturr
Dept. 3450
BLDG. 53
CHRYSLER CORPORATION
BLDG. 52
BLDG. 50
BLDG. 47
100,000 GAL. TANK
METER PIT-3" METER OFF FIRE LINE
BLDG. 39
BLDG. 15
BLDG. 10
BLDG. 9
BLDG. 8
BLDG. 7
BLDG. 6
BLDG. 40
BLDG. 40-A
BLDG. 34
BLDG. 3-A
BLDG. 34-B
CHRYSLER CORPORATION
BLDG. 3
BLDG. 40-B
8" FIRE LINE
8" DOMESTIC
PIT DETAIL
10" COMB
BLDG. 3-B
BLDG. 3-A
4"-2" RED
10" FIRE LINE
8" DOMESTIC
METER PIT
VALVE CLOSED

WATER ANALYSIS REPORT

THE MOGUL CORPORATION, CLEVELAND, OHIO 44122

Job No. 8391

To: Chrysler Airtemp Div., Chrysler Corporation, Dayton, Ohio

Attention of: Title

Analysis Made 5/1/69

Covering Use of: in

Report Mailed 5/13/69

SAMPLE No.	No. 1	No. 2	No. 3	No. 4	No. 5	No. 6
Total Hardness	162	140	184			
Calcium	250	240	192			
Magnesium	176	200	192			
Iron	0	0	0			
Silica	12	14	20			
Phosphate	0	0	0			
Phenol. Alkalinity (P)	0	0	0			
Total Alkalinity (M)	302	300	284			
Chloride	16	62	30			
Sulfate	224	176	140			
Total Dis'd Solids	680	720	540			
pH	7.3	7.2	7.3			
Sludge	none	none	none			
Oil						
Color	none	none	none			

Total Hardness, Calcium, Magnesium, Phenol. Alkalinity and Total Alkalinity reported as equivalent $CaCO_3$. Results above are expressed in parts per million. To convert to grains per gallon divide by 17.1.

SAMPLE No.	SAMPLE TAKEN FROM	DATE	TIME	MOGUL PRODUCT	DOSAGE
1	#1 Well - Bldg. 40	4/22			
2	#2 Well supply - Boiler House				
3	#3 Well - Bldg. 50 - 1000 gpm				
4					
5					
6					

Remarks and Recommendations:

RBJ/cp

ST-22

CITY OF DAYTON

CHRYSLER AIRTEMP SALES CORP.

9-185
(October 1950)

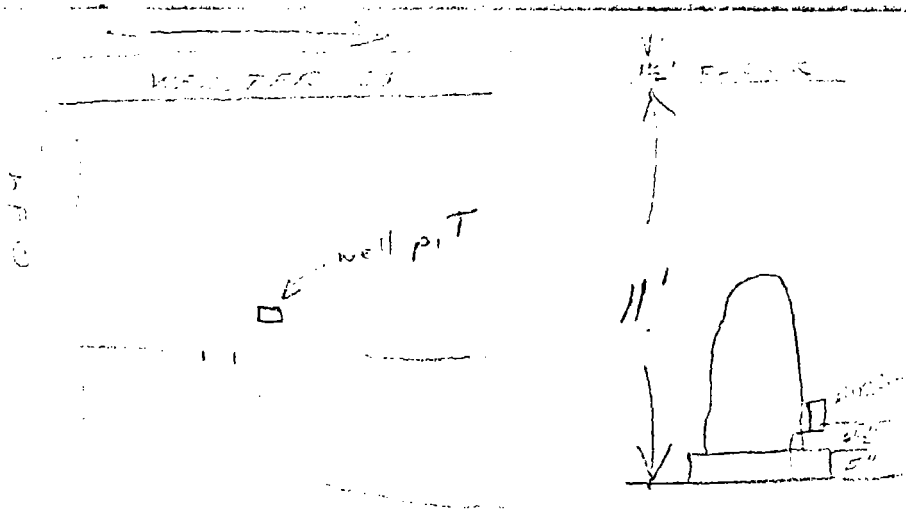
UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY
WATER RESOURCES DIVISION

WELL SCHEDULE

Date [illegible], 19[illegible] Field No. [illegible]
Record by [illegible] Office No. [illegible]
Source of data [illegible]

1. *Location:* State [illegible] County [illegible]
Map [illegible]
[illegible] ¼ [illegible] ¼ sec. [illegible] T [illegible] N/S R [illegible] E/W
2. *Owner:* [illegible] Address [illegible]
Tenant [illegible] Address [illegible]
Driller [illegible] Address [illegible]
3. *Topography* [illegible]
4. *Elevation* [illegible] ft. above/below [illegible]
5. *Type:* Dug, drilled, driven, bored, jetted [illegible] 19[illegible]
6. *Depth:* Rept. [illegible] ft. Meas. [illegible] ft.
7. *Casing:* Diam. [illegible] in., to [illegible] in., Type [illegible]
Depth [illegible] ft., Finish [illegible]
8. *Chief Aquifer* [illegible] From [illegible] ft. to [illegible] ft.
Others [illegible]
9. *Water level* [illegible] ft. rept./meas. [illegible] 19[illegible] above/below [illegible]
[illegible] which is [illegible] ft. above/below surface
10. *Pump:* Type [illegible] Capacity [illegible] G. M.
Power: Kind [illegible] Horsepower [illegible]
11. *Yield:* Flow [illegible] G. M., Pump [illegible] G. M., Meas., Rept. Est. [illegible]
Drawdown [illegible] ft. after [illegible] hours pumping [illegible] G. M.
12. *Use:* Dom., Stock, PS., RR., Ind., Irr., Obs. [illegible]
Adequacy, permanence [illegible]
13. *Quality* [illegible] Temp [illegible] °F.
Taste, odor, color [illegible] Sample Yes/No [illegible]
Unfit for [illegible]
14. *Remarks:* (Log, Analyses, etc.) [illegible]

U. S. GOVERNMENT PRINTING OFFICE 16—[illegible]


well pit
11'

9-185
(October 1950)

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY
WATER RESOURCES DIVISION

WELL SCHEDULE

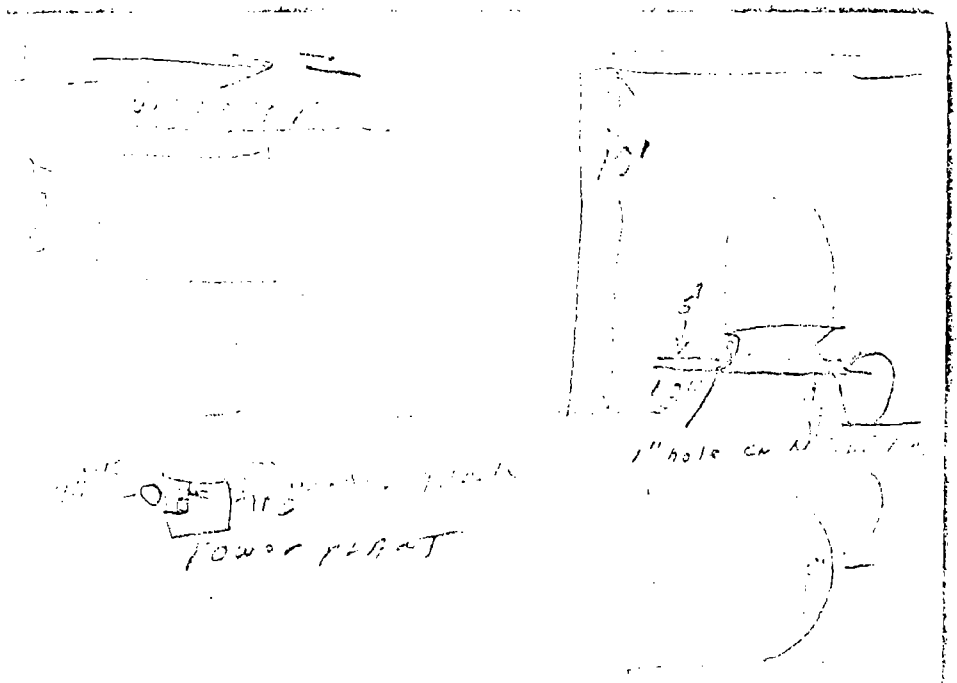
Date ....., 19..... Field No. .....

Record by ..... ~~Office No.~~ .....

Source of data .....

1. *Location:* State ..... County .....
   Map .....
   ..... ¼ ..... ¼ sec. ..... T ..... N/S R ..... E/W
2. *Owner:* ..... Address .....
   Tenant ..... Address .....
   Driller ..... Address .....
3. *Topography* .....
4. *Elevation* 752 ft. above/below .....
5. *Type:* Dug, drilled, driven, bored, jetted ..... 19.....
6. *Depth:* Rept. ..... ft. Meas. ..... ft.
7. *Casing:* Diam. ..... in., to ..... in., Type .....
   Depth ..... ft., Finish .....
8. *Chief Aquifer* ..... From ..... ft. to ..... ft.
   Others .....
9. *Water level* ..... ft. rept./meas. ..... 19..... above/below .....
   ..... which is ..... ft. above/below surface
10. *Pump:* Type ..... Capacity ..... G. M. .....
    Power: Kind ..... Horsepower .....
11. *Yield:* Flow ..... G. M., Pump ..... G. M., Meas., Rept. Est. .....
    Drawdown ..... ft. after ..... hours pumping ..... G. M.
12. *Use:* Dom., Stock, PS., RR., Ind., Irr., Obs. .....
    Adequacy, permanence .....
13. *Quality* ..... Temp ..... °F.
    Taste, odor, color ..... Sample Yes/No .....
    Unfit for .....
14. *Remarks:* (Log, Analyses, etc.) .....

U. S. GOVERNMENT PRINTING OFFICE 16—[illegible]


1" hole

9-185
(October 1950)

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY
WATER RESOURCES DIVISION

WELL SCHEDULE

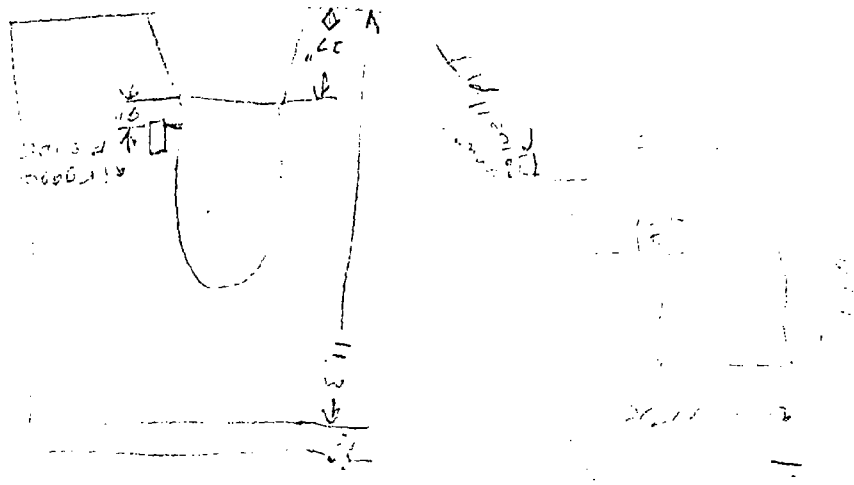
Date [illegible], 19..... Field No. [illegible]

Record by [illegible] Office No. [illegible]

Source of data [illegible]

1. *Location:* State [illegible] County [illegible]
   Map [illegible]
   ..... ¼ ..... ¼ sec. ..... T ..... N/S R ..... E/W
2. *Owner:* [illegible] Address [illegible]
   Tenant ..... Address .....
   Driller [illegible] Address [illegible]
3. *Topography* [illegible]
4. *Elevation* 750 ft. above/below .....
5. *Type:* Dug, drilled, driven, bored, jetted ..... 19[illegible]
6. *Depth:* Rept. [illegible] ft. Meas. ..... ft.
7. *Casing:* Diam. [illegible] in., to ..... in., Type .....
   Depth ..... ft., Finish [illegible]
8. *Chief Aquifer* ..... From ..... ft. to ..... ft.
   Others .....
9. *Water level* [illegible] ft. rept./meas. [illegible] 19[illegible] above/below [illegible]
   [illegible] which is [illegible] ft. above/below surface
10. *Pump:* Type [illegible] Capacity ..... G. M. .....
    Power: Kind [illegible] Horsepower [illegible]
11. *Yield:* Flow ..... G. M., Pump [illegible] G. M., Meas., Rept. Est. .....
    Drawdown ..... ft. after ..... hours pumping ..... G. M.
12. *Use:* Dom., Stock, PS., RR., Ind., Irr., Obs. .....
    Adequacy, permanence .....
13. *Quality* [illegible] Temp ..... °F.
    Taste, odor, color ..... Sample Yes/No .....
    Unfit for .....
14. *Remarks:* (Log, Analyses, etc.) [illegible]

U. S. GOVERNMENT PRINTING OFFICE 16—62891-1



9-135
(October 1950)

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY
WATER RESOURCES DIVISION

WELL SCHEDULE

Date 6, 1957 ~~Field No.~~

Record by JL ~~Office~~ No. 97894

Source of data See Mr. Tilman

1. *Location:* State County Mont
   Map Mad River Twp - sec 5
   ¼ ¼ sec. T N/S R E/W
2. *Owner:* Chrysler Airtemp Address 1600 Webster
   Tenant Address
   Driller Don Roe Address
3. *Topography*
4. *Elevation* 750± ft. above/below
5. *Type:* Dug, drilled, driven, bored, jetted 4 1954
6. *Depth:* Rept. 136 ft. Meas. ft.
7. *Casing:* Diam. 18 in., to in., Type
   Depth 116 ft., Finish
8. *Chief Aquifer* From ft. to ft.
   ~~Others~~ 20' Screen
9. *Water level* 20 ft. rept./meas. 4 1954 above/below
   which is ft. above/below surface
10. *Pump:* Type — Capacity G. M.
    Power: Kind Horsepower
11. *Yield:* Flow G. M., Pump 1000 G. M., Meas., Rept. Est.
    Drawdown 18 ft. after 10 hours pumping G. M.
12. *Use:* Dom., Stock, PS., RR., Ind., Irr., Obs.
    Adequacy, permanence
13. *Quality* Temp °F.
    Taste, odor, color Sample Yes/No
    Unfit for
14. *Remarks:* (Log, Analyses, etc.)

U. S. GOVERNMENT PRINTING OFFICE 16—62891-1

#12

dirty gr	0 - 28
crse gr	37
" "	50
dirty gr	57
yell till	55
blu till	60
gr	65
crse s	70
s & gr	82
red & blu till	84
dirty gr	85
blu till	100
s & gr	128
blu till	129
crse s	137
gr	136

[illegible] – [illegible]

[illegible] = [illegible]

[illegible] – 1942

500 GPM × [illegible] = 60 million [illegible]

1942 – 1946

500 GPM × 60 × 16 × 50 = 120 million [illegible]

1947 – 158

48 – 169

49 – 180

50 – 193

51 – 204

52 – 215

53 – 226

54 – ~~237~~ 478

[illegible]	3/21	21	2120	1000	2120
[illegible]	3/28	49	4940	400	1980
Boiler House	4/4	99	9950	500	4950
					9080 M gall/week

Avg. water pumped per week during test — 9080 M gallons

Less avg. makeup for Boiler House per week during time period — 182 M gallons

Water required per week for production — 8899 M gallons/wk

Water pumped for boiler house:

$\frac{3,100 \text{ mlb steam/wk}}{8\ 1/3}$ x 30% makeup = avg. after year — 112 M gallons/wk

Water pumped for air conditioning:

$\frac{40\ \text{GPM} \times 10080 \text{ min/wk}}{1000}$ = 403 M gal/wk — 1,728,000 gal per month around 5.4 month

Avg. per wk = 403 M gal x 45% cooling time/year = 182 M gallons/wk

Total / week = 9,193,000 gallons

Total / year = 478,036,000 gallons

AVG. PUMP REQUIRED FIGURES BASED ON TIME METER ON EACH PUMP FOR 1 WEEK PERIOD.

FLOWING OUT PUT OF 2 OLD WELLS REDUCED TO 700 & 500 GPM

468,[illegible]
9,321,[illegible]
477,903[illegible]

9-275d
(Feb. 1951)

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY
WATER RESOURCES BRANCH

Date [illegible], 19[illegible]

MISCELLANEOUS FIELD NOTES

[illegible]

No. of sheets

16—68176-2 U. S. GOVERNMENT PRINTING OFFICE

[illegible] cap 500 GPM 24 hr 360 [illegible]

[illegible] GPD or [illegible] GPY

[illegible] WELL cap 400 GPM [illegible] 250 [illegible]

480,000 GPD or 120,000,000 GPY

[illegible] well cap 1000 GPM 4 hr - 250 [illegible]

240,000 GPD or 60,000,000 GPY

542,880,000 year

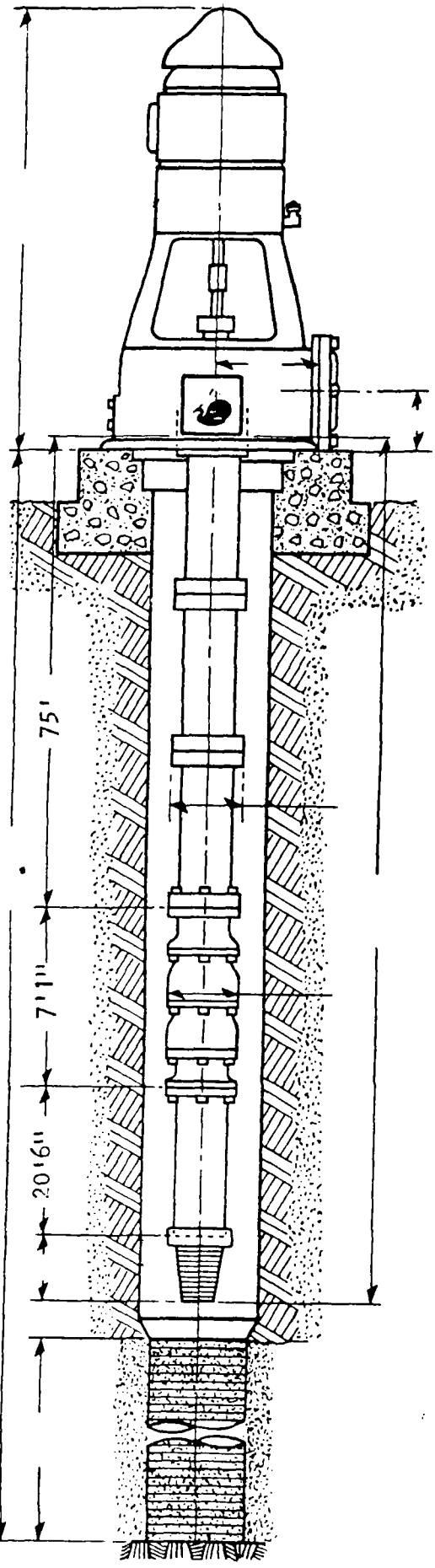
45,240,000 [illegible]

1,508,000 [illegible]

[illegible]

MOODY'S OF DAYTON, INC.

VANDALIA, OHIO



TURBINE PUMP INSTALLATION FOR:

Chrysler Dayton Plant 1

WELL DESIGNATION NO. 3 at Bldg. # 50

DEMING

T16586	SERIAL NUMBER
1000	GALLONS PER MINUTE
237	TOTAL HEAD IN FEET
12"	6 STAGES
1750	MOTOR SPEED
75	FEET OF SETTING
8	SIZE COLUMN
No	OIL TUBE
1½"	LINE SHAFT
20'6"	8" SUCTION PIPE
75	H.P. 460 VOLT. 60 CURRENT
water	LUBRICATION
100	FEET OF AIRLINE
1-27-76	DATE INSTALLED

18"	I.D. OF WELL
136	FEET DEEP FROM FOUNDATION
	FEET DEEP FROM GRADE
	STRAINER LENGTH — SLOT
11'4"	STATIC LEVEL — DATE 1-27-76
	" " — "
	" " — "
	" " — "
	DATE DRILLED

PUMP REPAIRED — DATE 1-27-76

" " — " 7-31-70

" " — " 8-17-64

WELL ACID TREATED — DATE 1-27-76

" " " — " 7-31-70

COMMENTS —

Weather conditions did not permit a capacity test - Well was pumped off through a man hole.

FORM TPI-762

LITHO IN U.S.A.

*OHIO DEPT. OF NATURAL RESOURCES SAYS THERE IS NO WELL LOG FOR BLDG. 39

WELL LOG FOR BLDG. 50

Drilled 1954 by Don Roe (Information per Ed Wagner, President, Moody's Inc.)

0- 28 ft. - Dirty Gravel

28- 37 ft. - Coarse SAND

37- 50 ft. - Coarse Gravel

50- 54 ft. - Dirty Gravel

54- 55 ft. - Yellow Till

55- 60 ft. - Blue Till

60- 65 ft. - Good Gravel

65- 70 ft. - Coarse Sand

70- 82 ft. - Coarse Sand and Gravel

82- 84 ft. - Red and Blue Clay

84- 85 ft. - Dirty Gravel

85-100 ft. - Blue Till

100-128 ft. - Medium gravel and Sand

128-129 ft. - Blue Till

129-133 ft. - Coarse Sand

133-136 ft. - Medium Gravel

Depth 136-137 ft.

029/0

FILE: BLDG. 50 WELL

CALGON
CORPORATION

SUBSIDIARY OF MERCK & CO., INC.

WATER MANAGEMENT DIVISION CALGON CORPORATION 4670 PADDOCK ROAD CINCINNATI, OHIO 45229 (513) 242-0161

June 11, 1975

Chrysler Corporation
Plant #1
5407 Dayton
Dayton, Ohio 45404

Attention: Carl Henry, Manager Maintenance & Service

Subject: Calgon Water Analyses Samples #L5685 thru L5688

Gentlemen:

Attached are our analyses for samples #L5685 through #L5688.

The two well water samples (#L5685 and #L5687) show that there is approximately 10.5% more hardness in the power plant well than there is in the building #50 well.

Our Calgon TG-10 determinations showed you were feeding 2.4 ppm and 3.3 ppm respectively. This is slightly low.

The boiler water sample (L5686) indicates protective conditions. A lower phosphate residual would be a way to make further improvement.

The condensate sample (#L5688) shows that you are producing good quality steam.

Very truly yours,

CALGON CORPORATION

Joseph A. Ivancic

Joseph A. Ivancic
Water Management Division

JAI/mp/att.
cc: J. Knapp
cc: H. C. Brush
cc: Thomas Sturr

PLANT Chrysler Corporation, Plant #1, 5407 Dayton, Dayton, Ohio 45404

LABORATORY NO	L5685	L5686	L5687	L5688
DATE SAMPLED	May, 1975	May, 1975	May, 1975	May, 1975
DESCRIPTION	Well Water Bldg. #50 Water white, very sl. turbid	#4 Boiler Water Water white, turbid	Well Water Bldg. 39 (Power Plant) Water white, clear	Condensate Water white, clear
	HALL	HALL	HALL	HALL
pH Value @ 25°C	7.7		7.7	6.5
TITRATIONS ml — A Reading	-		-	
MO Reading	17.5		18.8	0.1
B Reading		20.2		
Conductivity @ 77°F (micromhos/cm)	735 unneut.	4150 neut. 5545 unneut.	865 unneut.	4.4 unneut.
Dissolved Solids				
Suspended Solids	est. 5-10	est. 200-800	est. < 5	est. < 5
Total Solids				
CONCENTRATIONS IN mg/l — Hydroxide (OH)				
Carbonate (CO_3)				
Bicarbonate (HCO_3)	355	88	382	2
Carbon Dioxide (CO_2)				2
Ammonia (NH_3)				0.15
Chloride (Cl)	32	490	59	
Sulfate (SO_4)				
Silica (SiO_2)		38		
Nitrate (NO_3)				
Orthophosphate (PO_4)		84		
Polyphosphate (as PO_4)				
Organic Phosphorus (as PO_4)				
Hardness (as $CaCO_3$)	376		420	
Calcium (Ca)				
Magnesium (Mg)				
Sodium (Na)				
Iron (Fe)	2.4		3.3	
Potassium (K)				
Copper (Cu)				
Manganese (Mn)				
Zinc (Zn)				

LJB engineers architects

FAX COVER

To: DOUG ORF / BOB EDENS Date: 15 JULY 94

ACUSTAR INC

Fax #: 224 2915

From: GERRY NOE

DOUG:

THIS IS WHAT KELLY O'LEARY HAS SIZED FOR THE WELL PIPING. WE KNOW IT'S VERY BIG! PLEASE COMMENT ON THIS PRELIMINARY LAYOUT, AND ALSO COPY BOB EDENS. THEN CALL TO DISCUSS.

THANKS

GERRY NOE

We are transmitting 1 page(s), excluding this cover sheet. If you do not receive all of this transmission, please call (513) 259-5000.

Lockwood, Jones & Beals, Inc.
3100 Research Blvd. • P.O. Box 20246 • Dayton, Ohio 45420-0246
(513) 259-5000 • Phone • (513) 259-5100 - FAX

LJB

Cincinnati, Ohio
Dayton, Ohio
Lima, Ohio

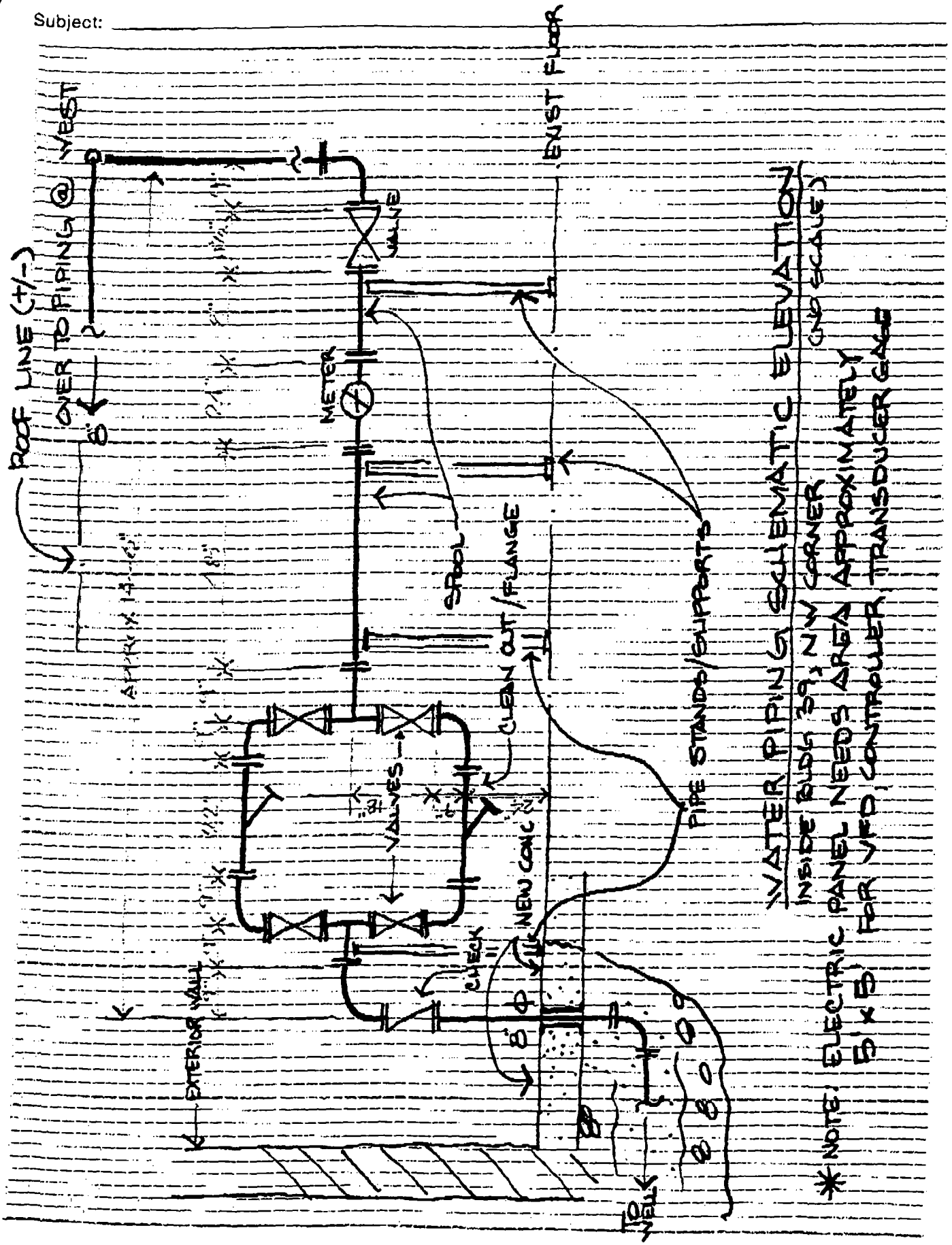
Job No. _____, Sh. 1 Of 1, Pg. ____

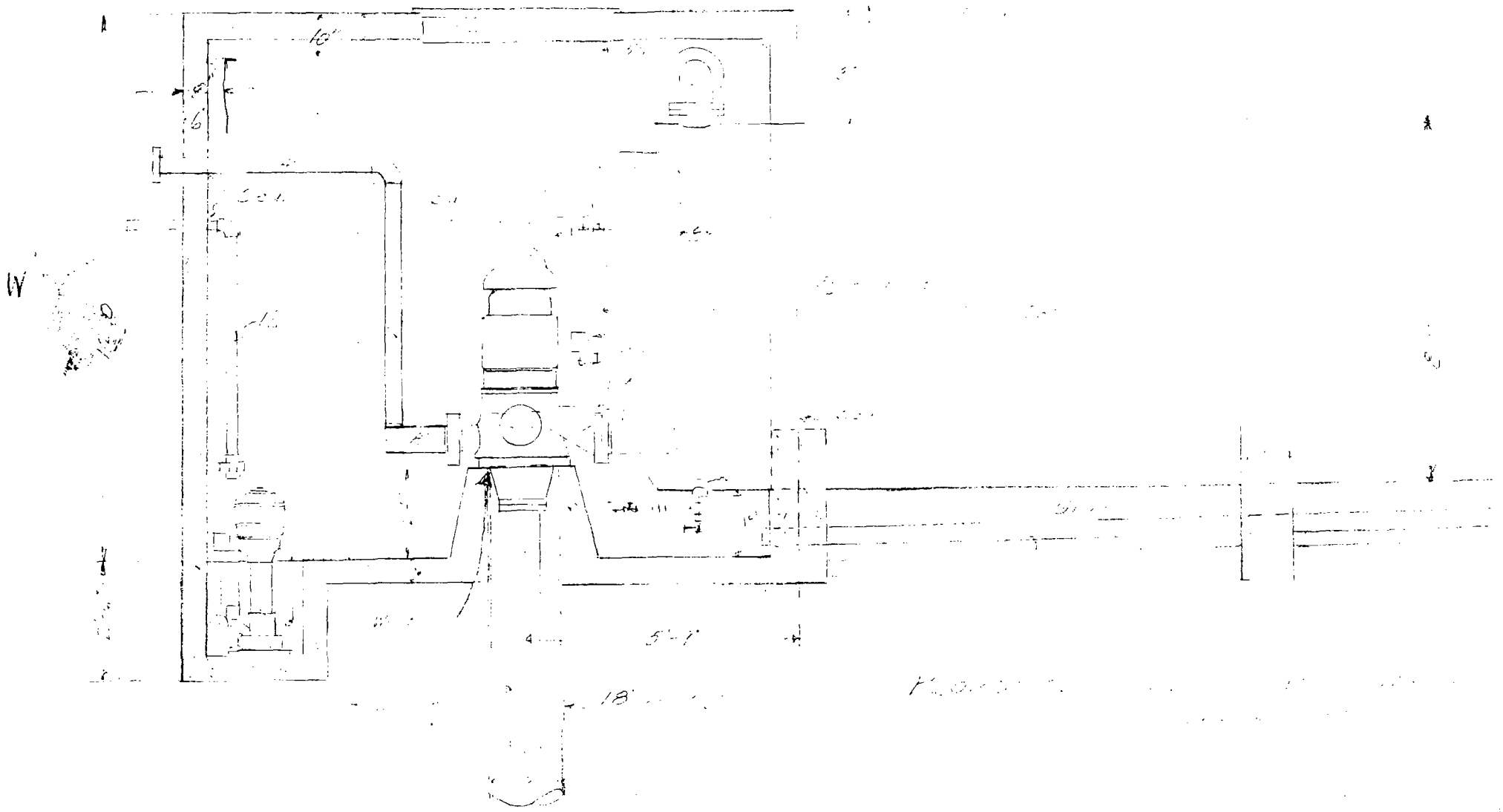
Project ACUSTAR WATER WELL

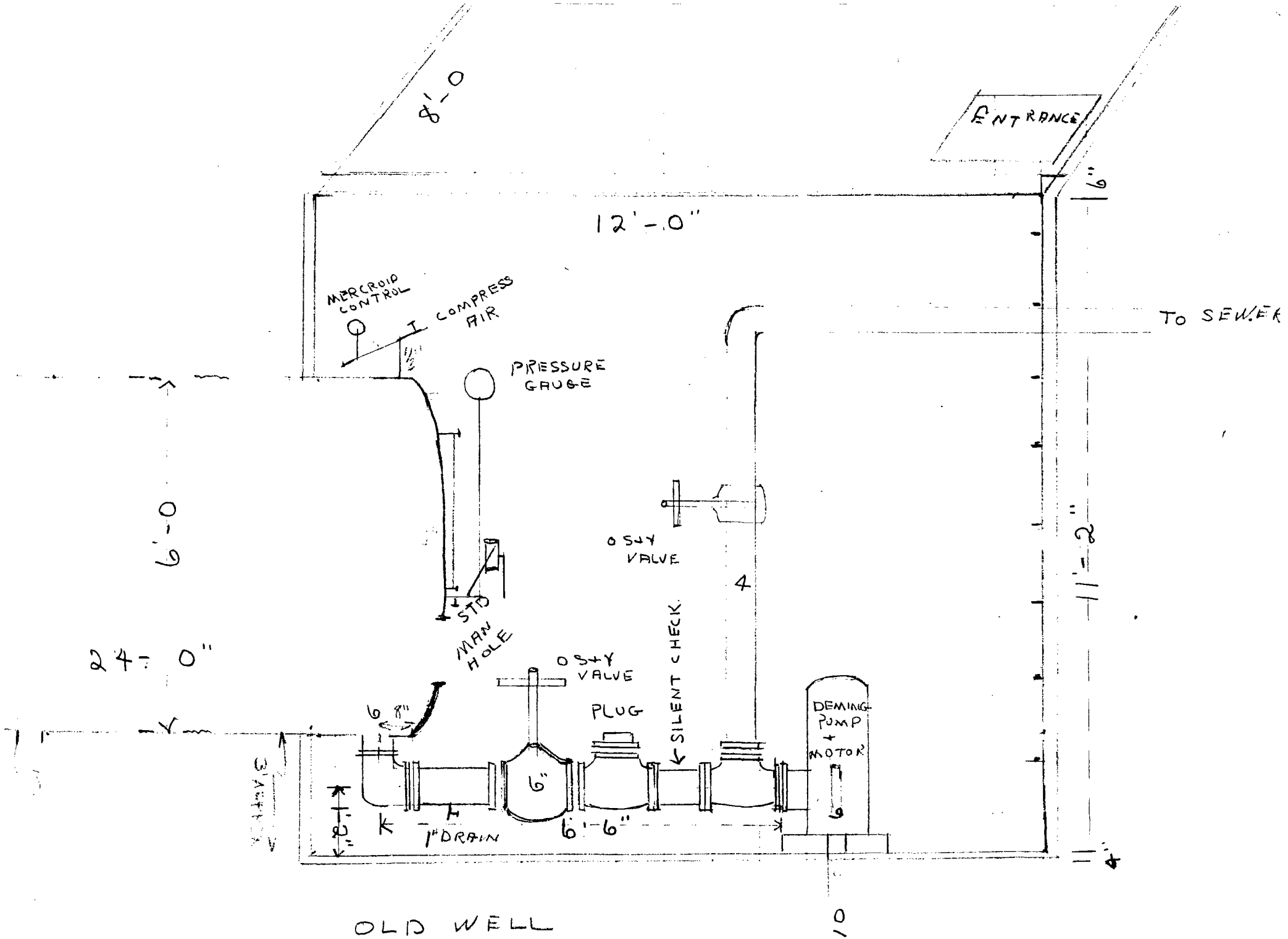
By KJO/GJN Date 14 JULY 94

Ck _____ Date _____

Subject:







8'-0
ENTRANCE
12'-0"
MERCROID CONTROL
COMPRESS AIR
PRESSURE GAUGE
TO SEWER
6'-0
24'-0"
STD MAN HOLE
O S+Y VALVE
4
SILENT CHECK
O S+Y VALVE
PLUG
DEMING PUMP + MOTOR
6 8"
6"
1" DRAIN
6'-6"
11'-2"
6"
4"
OLD WELL
10

2.94
USE PEN
ANSCRIBING
ESS HARD

WELL LOG AND DRILLING REPORT

Ohio Department of Natural Resources
Divison of Water, 1939 Fountain Square Drive
Columbus, Ohio 43224 Phone (614) 265-6739

819550

Permit Number _____

JNTY Montgomery TOWNSHIP N/A SECTION/LOT No. _____ (Circle One)

OWNER/BUILDER (Circle One or Both) Chrysler Corp. First Last PROPERTY ADDRESS (Address of well location) 1600 Webster St. Number Street Dayton, OH City

LOCATION OF PROPERTY Dayton, Ohio Zip Code + 4

CONSTRUCTION DETAILS

CASING *(Length below grade) Borehole Diameter 20 in.

1 Diameter 20 in. Length* 120 ft. Wall Thickness .375 in.

2 Diameter _____ in. Length* _____ ft. Wall Thickness _____ in.

ype: [X] Steel [1] Galv. [1] PVC [1] [2] [2] [2] Other _____

oints: [1] Threaded [1X] Welded [1] Solvent [1] [2] [2] [2] Other _____

ner: Length N/A Type _____ Wall Thickness _____ in.

CREEN

pe (wire wrapped, louvered, etc.) ww Material ss 304

ngth 30 ft. Diameter 20" tele. in.

t between 120 ft. and 150 ft. Slot .030-.100

GROUT

Material N/A Volume used _____

Method of installation _____

Depth: placed from _____ ft. to _____ ft.

GRAVEL PACK (Filter Pack)

Material N/A Volume used _____

Method of installation _____

Depth: placed from _____ ft. to _____ ft.

Pitless Device [X] Adapter [ ] Preassembled unit

Use of Well Cooling

[ ] Rotary [X] Cable [ ] Augered [ ] Driven [ ] Dug [ ] Other _____

Date of Completion 1994

WELL LOG*

DICATE DEPTH(S) AT WHICH WATER IS ENCOUNTERED.

Show color, texture, hardness, and formation: sandstone, shale, limestone, gravel, clay, sand, etc.	From	To
ackfill	0	3
nd and gravel	3	30
ay	30	32
nd & gravel, few boulders	32	80
ay clay w/ S&G strips	80	93
ay clay, hard drilling	93	105
d and gravel	105	118
d & gravel, few boulders	118	151

al space is needed to complete well log, use next consecutively numbered form.)

WELL TEST

[ ] Bailing [X] Pumping* [ ] Other _____

Test rate 614 gpm Duration of test 8 hrs.

Drawdown 10 ft.

Measured from: [X] top of casing [ ] ground level [ ] Other _____

Static Level (depth to water) 26'8" ft. Date: July 1994

Quality (clear, cloudy, taste, odor) Clear

*(Attach a copy of the pumping test record, per section 1521.05, ORC)

PUMP

Type of pump BJ 11MQH-5 Capacity 1000 gpm

Pump set at 100 ft.

Pump installed by Moody's of Dayton, Inc.

WELL LOCATION

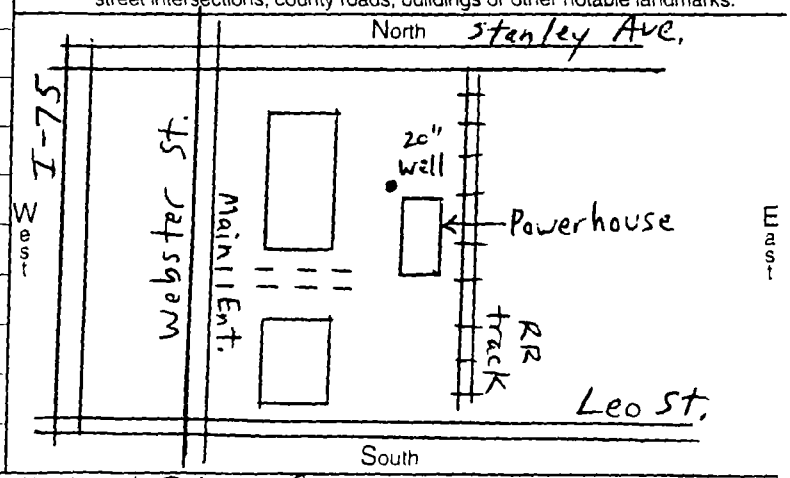
Location of well in State Plane coordinates, if available:

Zone _____ x _____ y _____

Elevation of well _____ ft./m. Datum plain: [ ] NAD27 [ ] NAD83

Source of coordinates: [ ] GPS [ ] Survey [ ] Other _____

Sketch a map showing distance well lies from numbered state highways, street intersections, county roads, buildings or other notable landmarks.



I hereby certify the information given is accurate and correct to the best of my knowledge.

Signed Douglas F. Wagner

Date March 16, 1998

ODH Registration Number 636

Moody's of Dayton, Inc.

4359 Infirmary Road

ip Miamisburg, OH 45343

Completion of this form is required by section 1521.05 Ohio Revised Code

ORIGINAL COPY TO ODNR

MOODY'S of Dayton, Inc.

ADDRESS REPLY TO:
P.O. DRAWER 509
MIAMISBURG, OHIO 45342
PHONE AC 513-859-4482

November 11, 1987

Chrysler Motor Corporation
Acustar/Dayton Thermal Products
1600 Webster Street
P.O. Box 1205
Dayton, Ohio 45406

Attention: Mr. Vern Allen

Subject: Report and Quote on Bldg. #50
Well and Pump

Gentlemen:

We have pulled the subject pump for inspection to determine vibration problem and leakage in the stuffing box area. Prior to pulling the pump a short capacity-draw down test was conducted to determine the condition of the well and pump. Two (2) copies of the test results are enclosed for your perusal. We have also enclosed two (2) copies of the short pumping test conducted 9/24/85 for comparative purposes with the recent test.

You will notice comparing the two tests that the pump shut-off pressure is down 17 psi from two years ago. Our inspection of the impellers removed from the bowl assembly shows that the open impellers were set too low and rubbed on the bowl face thus reducing the capacity and pressure capabilities of the bowl assembly. At your operating pressure of 70-75 psi you can only pump about 600 GPM into your system. The pump was originally designed to pump 900-1000 GPM into your system.

The pump test shows the well to be in good condition which it should be after chemical treatment and revitalization back in 1985.

Minimum repairs required to put this pump back into service would be as follows:

1 - Stuffing box bearing
6 - Clean and paint, and straighten lineshafts
6 - Rubber line shaft bearings

MOODY'S of Dayton, Inc.

4359 INFIRMARY ROAD
MIAMISBURG, OHIO 45342
513/859-4482

PRODUCTION TEST OF WELL

JOB NO. 48002

WNER Chrysler Motor Corporation

DATE TESTED 11/5/87 WELL NO. Bldg. #50

CITY Dayton STATE Ohio

TESTED BY B. Beck

OCATION N.E. corner of building

WATER DISCHARGED _____ . FEET FROM WELL

:A. OF WELL _____ DEPTH _____ PUMP USED: DRIVER _____

:RLINE LENGTH _____ STATIC LEVEL 30'1" top of pit COLUMN AND SHAFT _____

:IFICE SIZE 6 x 4-3/4 BOWLS _____

PE WELL: GRAVEL WALL _____ TUBULAR _____ ROCK _____ NEW _____ OLD _____ CLEANED _____

REEN: LENGTH _____ DIA. _____ SLOT SIZE _____ TYPE _____ DEPTH TO TOP _____

'IME	ORIFICE READING	G.P.M.	AIR CAUGE READING	PUMPING LEVEL	DRAW DOWN	DISC. PRESS. LBS.	DISC. PRESS. FEET	TOTAL PUMPING HD.	REMARKS
:05						120			Shut-off top of pit to
:06	31		45'6"	45'6"	15'5"	80			well 10'3".
:10	31		45'6"	45'6"	15'5"	80			
15	31	566	45'7"	45'7"	15'6"	80			Pump 10'3" above well
20	31		45'6"	45'6"	15'6"	80			
23	71		53'1"	53'1"	23'	40			
25	71		53'2"	53'2"	23'1"	40			
30	71	856	53'1"	53'1"	23'	40			
35	71		53'1"	53'1"	23'	40			
40	71		53'1"	53'1"	23'	40			
3	97		60'4"	60'4"	30'3"	0			
5	97		60'4"	60'4"	30'3"	0			
0	97	1000	60'4"	60'4"	30'3"	0			
5	97		60'4"	60'4"	30'3"	0			
	97		60'4"	60'4"	30'3"	0			

MOODY'S of Dayton, Inc.

Developers of
UNDERGROUND WATER SUPPLY
"Since 1885"

PRODUCTION TEST OF WELL

JOB # 45147

OWNER Chrysler Corporation CITY Dayton STATE Ohio

WELL NO. 3-Bldg#50 LOCATION Building #50

MEASURED FROM GROUND LEVEL: TOTAL DEPTH ____ INSIDE DIA. ____ STANDING WATER LEVEL 27'9"

TYPE WELL: GRAVEL WALL ____ TUBULAR ____ ROCK ____ NEW ____ OLD ____ CLEANED ____ GRAVEL WALL DIA. ____

SCREEN: LENGTH ____ DIA. ____ SLOT SIZE ____ TYPE ____ DEPTH TO TOP ____

ORIFICE SIZE ____ BY ____ WATER DISCHARGED ____ FEET FROM WELL INTO ____

DATE	TIME	INCHES ON ORIFICE	GALLONS PER MINUTE	PUMPING LEVEL	DISCHARGE PRESSURE	REMARKS
9/24/85	10:50	--	--	--	--	Static Level
		--	--	27'9"	137	Shut-off head
	10:55	8	361	48'10½"	114	
	11:00	8	361	48'10½"	114	NOTE: P.L. taken at ground level
	11:05	17	510	60'2"	105	Pressures measured down in pit 10'
	11:10	17	510	60'9"	105	below ground
	11:15	43	815	85'8"	62	
	11:20	43	815	86'1"	62	
	11:25	65	981	102'5"	24	Open valve
	11:30	65	981	102'7½"	24	
						Original Design: 1000 GPM @ 237'/

MOODY'S INC.

Specialists in Geophysical Surveys
GAMMA RAY AND ELECTRIC LOGS
RESISTIVITY SURVEYS
AERIAL PHOTOGRAPHY STUDIES

Specialists in Piezometer Installations
PUMP SALES AND REPAIRS
WELL DRILLING
WELL CLEANING

EPA Region 5 Records Ctr.
349883

THE OHIO DRILLING CO.
INCORPORATED
MASSILLON, OHIO

MW1

DRILLED FOR Gem City Chemicals, Inc. - Dayton, Ohio HOLE NO. 1- 3"
Test Hole

DRILLED BY Glyn Davis DRILLER COMPLETED November 6, 19 87

LOCATION Near southwest corner of plant site

THICKNESS OF STRATA	STRATA	TOTAL DEPTH	HEAVED	WATER FROM SURFACE
5 ft.	Dry Sand, Gravel & Clay	25 ft.		
11 ft.	Dry Sand, Gravel & Less Clay	36 ft.		
2 ft.	Sand, Fine Sand, Gravel & Clay	78 ft.		29' 5"
11 ft.	Sand, Clay & Stones	89 ft.		
	Pumped for water samples at following depths:			
	1) 35' - 37'			
	2) 40' - 43'			
	3) 48' - 51'			
	4) 55' - 58'			
	5) 61' - 64'			
	6) 68' - 71'			
	7) 71' - 73'			
	8) 78' - 83'			
	9) 87' - 89'			

THE OHIO DRILLING CO.

INCORPORATED

MASSILLON, OHIO

MW 2

DRILLED FOR Gem City Chemicals, Inc. - Dayton, Ohio HOLE NO. 2 - 5"
Test Hole

DRILLED BY Alan Graber DRILLER COMPLETED December 4, 19 87

LOCATION Northwest of drum flushing shed

NO. OF STRATA	STRATA	TOTAL DEPTH	HEAVED	WATER FROM SURFACE
[illegible] ft.	Brown Fine Sand, Small Gravel & Clay	35 ft.		30 ft.
[illegible] ft.	Brown Sand, Small Gravel & Clay	50 ft.		
5 ft.	Brown Sand & Clay	55 ft.		
[illegible] ft.	Brown Sand, Gravel & Clay	75 ft.		
6 ft.	Grey Sandy Clay with Stones	81 ft.		
	Pumped for water samples at following depths:			
	1) 40 ft.			
	2) 50 ft.			
	3) 60 ft.			
	4) 70 ft.			

THE OHIO DRILLING CO.

INCORPORATED

MASSILLON, OHIO

MW-3

DRILLED FOR Gem City Chemicals, Inc. - Dayton, Ohio HOLE NO. 3- 5" Test Hole

DRILLED BY Alan Graber DRILLER COMPLETED December 10, 19 87

LOCATION Northeast corner of lot south of warehouse

NO. OF STRATA	STRATA	TOTAL DEPTH	REAMED	WATER FROM SURFACE
25 ft.	Brown Sand, Small Gravel & Clay	25 ft.		
5 ft.	Brown Sand, Clay & Stones	30 ft.		30 ft.
5 ft.	Brown Sand & Clay Hardpan	35 ft.		
5 ft.	Brown Sand, Clay & Stones	40 ft.		
38 ft.	Brown Sand, Small Gravel & Clay	78 ft.		
5 ft.	Grey Sand, Small Gravel & Clay	83 ft.		
2 ft.	Grey Sand & Clay Hardpay	85 ft.		
	Pumped for water samples at following depths:			
	1) 41 ft.			
	2) 50 ft.			
	3) 59 ft.			
	4) 69 ft.			
	5) 78 ft.			

THE OHIO DRILLING CO.

INCORPORATED

MASSILLON, OHIO

MW4

FOR ~~Con City Chemicals, Inc. - Dayton, Ohio~~ HOLE NO. 4 - 5" Test Hole

BY Alan Graber DRILLER COMPLETED January 6, 19 88

LOCATION In aisle between drum storage areas

NO. OF STRATA	STRATA	TOTAL DEPTH	HEAVED	WATER FROM SURFACE
8 ft.	Sand, Clay & Gravel	8 ft.		
32 ft.	Sand, Clay & Small Stones	40 ft.		32 ft.
5 ft.	Sand, Gravel & Clay	45 ft.		
	Pumped for water sample at depth of 40 ft.			

LOG OF BORING

MW-5d

PROJECT NUMBER:	PROJECT NAME: Gem City Chemicals
BORING NUMBER: MW5-D	ELEVATION:
COORDINATES:	DATE STARTED: 9/6/88
DRILLING METHODS: H.S.A. with S.S.S.	DATE COMPLETED: 9/7/88
ENGINEER/GEOLOGIST: G. Clyburn	PAGE: 1 OF 2
DRILLER: Moody's of Dayton Inc.	GWL: 32' AT HRS.

DEPTH	SAMPLE TYPE & NO.	BLOWS ON SAMPLER PER	RECOVERY	DESCRIPTION	USCS SYMBOL	PROFILE	CASING BLOWS PER	ROCK RECOVERY % / RQD%	REMARKS
				black clay top soil		NA	NA	NA	
				course sand and gravel					
5	5	10-8-7							
				fine to medium tan sand with medium gravel, dry					
10	10	14-16-22							
15	15	34-38-21							
				grey clay/silt, dry					
20	20	30-31-37		fine to very course tan sand with gravel, dry					
25	25	54-60-68							
30	30	24-28-38		medium to course sand with large gravel moist at 30' wet at 32"					
35									
40									
45				fine sand and gravel, wet					

NOTES: Split spoon samples were taken at 18" intervals

QSOURCE ENGINEERING, INC.

LOG OF BORING, cont.

PROJECT NUMBER:	PROJECT NAME: Gem City Chemicals	
BORING NUMBER: MW 5- D	ELEVATION:	DATE STARTED: 9/6/88
COORDINATES:		DATE COMPLETED: 9/7/88
DRILLING METHODS: H.S.A. with S.S.S		PAGE: 2 OF 2
ENGINEER/GEOLOGIST: G.Clyburn		GWL: AT HRS.
DRILLER: Moody's of Dayton, INc.		

DEPTH	SAMPLE TYPE & NO.	BLOWS ON SAMPLER PER	RECOVERY	DESCRIPTION	USCS SYMBOL	PROFILE	CASING BLOWS PER	ROCK RECOVERY % / RQD%	REMARKS
				course grey sand and gravel	N	NA	NA	NA	
55									
60									
65									
70									
75									
		100-108							
80	80	156							
				dense, grey clay "hardpan"					
85									
90									
95									

NOTES:

Bottom of boring at 85'

QSOURCE ENGINEERING, INC.

LOG OF BORING

MW-5m

PROJECT NUMBER:	PROJECT NAME: Gem City Chemicals	
BORING NUMBER: MW5-M	ELEVATION:	DATE STARTED: 8/18/88
COORDINATES:		DATE COMPLETED: 8/26/88
DRILLING METHODS: H.S.A. with S.S.S.		PAGE: 1 OF 2
ENGINEER/GEOLOGIST: G. Clyburn		GWL: AT HRS.
DRILLER: G. J. Thelen		

DEPTH	SAMPLE TYPE & NO.	BLOWS ON SAMPLER PER	RECOVERY	DESCRIPTION	USCS SYMBOL	PROFILE	CASING BLOWS PER	ROCK RECOVERY % / RQD%	REMARKS
				black clay top soil		NA	NA	NA	
5	5	14-9-12		course sand and gravel					
10	10	21-15-9		fine to medium tan sand with medium gravel, dry					
15	15	6-23-16							
				greysilty clay, dry					
20	20	34-37-30		fine to very course tan sand with gravel, dry					
25	25	36-48-37							
30	30	29-36-21		medium to course sand with large gravel moist at 30' 6" wet at 32' 8"					
35	35	24-24-27							
40	40	34-12-21							
45	45	21-23-30		fine sand and gravel, wet					
	50	20-28-34							

NOTES:

QSOURCE ENGINEERING, INC.

LOG OF BORING, cont.

PROJECT NUMBER:	PROJECT NAME: Gem City Chemicals	
BORING NUMBER: MW5-M	ELEVATION:	DATE STARTED: 8/18/88
COORDINATES:		DATE COMPLETED: 8/26/88
DRILLING METHODS: H.S.A. with S.S.S		PAGE: 2 OF 2
ENGINEER/GEOLOGIST: G. Clyburn		GWL: 32'8" AT HRS.
DRILLER: G.J. Thelen		

DEPTH	SAMPLE TYPE & NO.	BLOWS ON SAMPLER PER	RECOVERY	DESCRIPTION	USCS SYMBOL	PROFILE	CASING BLOWS PER	ROCK RECOVERY % / RQD%	REMARKS
				course grey sand and gravel					
55	55	21-34-28							
60	60	20-30-31							
65									

NOTES:
Bottom of Boring at 60'

QSOURCE ENGINEERING, INC.

QSOURCE ENVIRONMENTAL SERVICES, INC.

SUBSURFACE EXPLORATION LOG

PROJECT Gem City Chemicals PROJECT # 193004

PIT OR BORING # P-6

PAGE 3 OF 3

DEPTH	SAMPLE INFORMATION #	TYPE	FROM / TO	REC	BLOW CT ADV RATE	ELEV	MATERIAL / DRILLING AND OTHER NOTES
30							
					8		SAND, coarse, little very coarse sand and
	16	SS	30'-32'	1.4'	10		granules, little fine to medium sand,
					18		trace silt, 2.5 Y 6/3, PID = 0.30
32					24		-- fining downward to --
					8		SAND, medium, little coarse to very coarse
	17	SS	32'-34'	0.9'	16		sand, trace silt, PID = 0.56
					30		
34					43		small pebbles in tip
					25		SAND, coarse to very coarse, few granules,
	18	SS	34'-36'	1.7'	25		few fine to medium sand, trace pebbles,
					22		trace silt, 2.5 Y 6/3
36					22		
					30		SAND, very coarse, little pebbles in discrete
	19	SS	36'-38'	1.5'	30		3" layers, little granules, few fine sand,
					32		few silt, in in 1' thick, fining upward
38					25		beds
					22		SAND, very coarse, some pebbles and broken
	20	SS	38'-40'	1.3'	18		fragments (to 2"), little granules, little
					19		fine to medium sand, few silt
40					18		
					16		SAND, very coarse, some pebbles and fragments
	21	SS	40'-42'	1.2'	16		little granules, few silt, trace fine sand,
					28		PID = 0.30
42					26		
					14		PEBBLES, some very coarse sand, little granules
	22	SS	42'-44'	1.2'	12		few silt, trace fine sand, PID = 0.30
					23		
44					21		
					18		SAND, very coarse, some pebbles and fragments
	23	SS	44'-46'	1.3'	18		(to 1 1/2"), little granules, few silt,
					18		trace fine sand, PID = 0.25
46					20		
					20		SAME AS ABOVE, PID = 0.11
	24	SS	46'-48'	1.5'	24		
					28		
48					22		
					24		SAME AS ABOVE, PID = 0.33
	25	SS	48'-50'	1.3'	24		
					16		
50					20		
							END OF BORING AT 50'

NOTES:

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County Permit No. _____

NO CARBON PAPER NECESSARY – SELF-TRANSCRIBING

WELL LOG AND DRILLING REPORT

State of Ohio
DEPARTMENT OF NATURAL RESOURCES
Division of Water
Fountain Square
Columbus, Ohio 43224

ORIGINAL

557913

RW-1

COUNTY Montgomery TOWNSHIP _____ SECTION OF TOWNSHIP _____

OWNER Gem City Chemical ADDRESS 1287 Air City Drive, Dayton, Ohio

LOCATION OF PROPERTY Same

CONSTRUCTION DETAILS

Casing diameter 8" Length of casing 30'

Type of screen Galvanized Length of screen 20'

Type of pump Goulds 300L30

Capacity of pump 300 GPM

Depth of pump setting 50'

Date of completion 3/89

BAILING OR PUMPING TEST
(specify one by circling)

Test rate N/A gpm Duration of test _____

Drawdown _____ ft Date _____

Static level (depth to water) 30'

Quality (clear, cloudy, taste, odor) _____

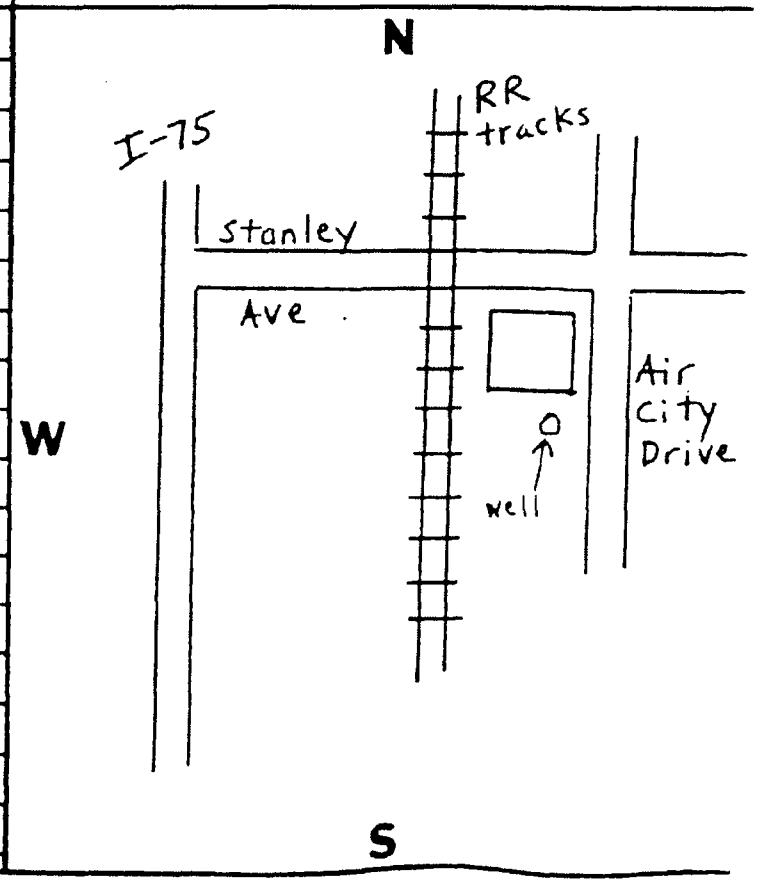
Pump installed by Moody's of Dayton, Inc.

WELL LOG*

Formations: sandstone, shale, limestone, gravel, clay	From	To
Concrete	0 ft	1 ft
Clay and gravel	1	8
Sand and gravel	8	19
Clay streak	19	21
Sand and gravel	21	60
Coarse sand, few gravel	60	65
Set 8" telescoping screen		
(30 slot) from 30'-50'.		
7" sump set from 50'-57'.		
Air developed 9 hours.		

SKETCH SHOWING LOCATION

Locate in reference to numbered state highways, street intersections, county roads, etc.



DRILLING FIRM Moody's of Dayton, Inc. DATE 9/21/89

ADDRESS P.O. Box 509, Miamisburg, OH 45343 SIGNED Doug Wagner

*If additional space is needed to complete well log, use next consecutive numbered form.

QSOURCE ENVIRONMENTAL SERVICES, INC.

SUBSURFACE EXPLORATION LOG

PIT OR BORING # SB-1

PAGE 1 OF 1

PROJECT Gem City Chemicals, Inc. PROJECT # 193004

GENERAL SITE LOCATION 1287 Air City Avenue

STATE Ohio COUNTY Montgomery CITY/TWP Dayton SEC

LOCATION ON THE SITE SW corner of site, 90' E of west fence, 38' N of SW corner of fence

METHOD(S) 4 1/4" HSA RIG CME-75 HOLE DIA. 9 " SAMPLER & SIZE 2"x24" Split Spoon

DRILLING CO. Moody's of Dayton DRILLERS P. Ridder, J. D. Hobbs LOGGED BY J. Michael Clinch

DATE STARTED 1/12/93 DATE FINISHED 1/12/93

_ BORING COMPLETED AS A _____ OR X BACKFILLED DATE 1/12/93 MATERIAL cement, 5% bentonite

DEPTH TO WATER: Encountered at N. E. ', At completion N. A. ', After N. A. Hrs. water was at N. A.'

DEPTH	SAMPLE INFORMATION #	TYPE	FROM / TO	REC	BLOW CT ADV RATE	ELEV.	MATERIAL / DRILLING AND OTHER NOTES
							surface: Grass and weeds, gravel and coal visible
0							
1	1	SS	0'-2'	1.5'	4 5 7 6		SILT, some medium to fine sand, little gravel, coal fragments, 2.5 Y 3/2, moist PID = 0
2							
3	2	SS	2'-4'	0.8'	4 6 8 10		SILT, little fine to medium sand, trace clay (stone in tip) 7.5 YR 4/6, moist PID = 0.7 -SAMPLED FOR VOCs (rig chatter, 3' to 4')
4							
5	3	SS	4'-6'	1.4'	9 17 13 20		SAND, medium to coarse, some gravel to 1/2", little fine sand, little silt 5 Y 5/4, moist, PID = 0
6							
7	4	SS	6'-8'	1.7'	35 32 41 35		SAND, coarse, some pebbles and broken fragments trace silt, trace fine to medium sand 2.5 Y 5/4 (silt color) dry to moist, PID = 0
8							
9	5	SS	8'-10'	1.5'	25 19 13 16		SAND, coarse to medium, some pebbles to 1", trace silt, trace fine to medium sand 2.5 Y 5/4 (silt color) dry, PID = 0
10							END OF BORING AT 10'

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QSOURCE ENVIRONMENTAL SERVICES, INC.

SUBSURFACE EXPLORATION LOG

PIT OR BORING # SB-2

PAGE 1 OF 1

PROJECT Gem City Chemicals, Inc. PROJECT # 193004

GENERAL SITE LOCATION 1287 Air City Avenue

STATE Ohio COUNTY Montgomery CITY/TWP Dayton SEC

LOCATION ON THE SITE NW corner of site, 70' E of west fence, 90' south of north fence

METHOD(S) 4 1/4" HSA RIG CME-75 HOLE DIA. 9 " SAMPLER & SIZE 2"x24" Split Spoon

DRILLING CO. Moody's of Dayton DRILLERS P. Ridder, J. D. Hobbs LOGGED BY J. Michael Clinch

DATE STARTED 1/12/93 DATE FINISHED 1/12/93

_ BORING COMPLETED AS A _____ OR X BACKFILLED DATE 1/12/93 MATERIAL cement, 5% bentonite

DEPTH TO WATER: Encountered at N. E. ', At completion N. A. ', After N. A. Hrs. water was at N. A.'

DEPTH	SAMPLE INFORMATION #	TYPE	FROM / TO	REC	BLOW CT ADV RATE	ELEV.	MATERIAL / DRILLING AND OTHER NOTES
							surface: Grass and weeds, coal fragments, gravel
0							
1	1	SS	0' - 2'	1.35	4 6 7 8		SILT and SAND, fine, trace clay, coal fragments 10 YR 4/4, moist, PID = 3.5 SAMPLED FOR VOCs
2							
3	2	SS	2' - 4'	1.2'	5 6 9 11		0.2 Same as above, PID = 1.5
4							1.0 GRAVEL and SAND, medium to coarse trace silt, moist, 2.5 Y 7/4
5	3	SS	4' - 6'	1.2'	10 15 15 18		SAND, medium to fine, some pebbles to 1", trace silt, dry to moist, 2.5 Y 7/4, PID = 0 (Pebbles to 2" diameter in auger flights)
6							
7	4	SS	6' - 8'	1.4'	20 31 29 27		SAME AS ABOVE, PID = 0
8							
9	5	SS	8' - 10'	1.5'	21 28 24 25		SAME AS ABOVE, PID = 0
10							END OF BORING AT 10'

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QSOURCE ENVIRONMENTAL SERVICES, INC.

SUBSURFACE EXPLORATION LOG

PIT OR BORING # SB-3
PAGE 1 OF 1

PROJECT Gem City Chemicals, Inc. PROJECT # 193004

GENERAL SITE LOCATION 1287 Air City Avenue

STATE Ohio COUNTY Montgomery CITY/TWP Dayton SEC

LOCATION ON THE SITE 180' E of western fence, 100' S of northern fence, unused western parcel

METHOD(S) 4 1/4" HSA RIG CME-75 HOLE DIA. 9 " SAMPLER & SIZE 2"x24" Split Spoon

DRILLING CO. Moody's of Dayton DRILLERS P. Ridder, J. D. Hobbs LOGGED BY J. Michael Clinch

DATE STARTED 1/12/93 DATE FINISHED 1/12/93

_ BORING COMPLETED AS A _____ OR X BACKFILLED DATE 1/12/93 MATERIAL cement, 5% bentonite

DEPTH TO WATER: Encountered at N. E. ', At completion N. A. ', After N. A. Hrs. water was at N. A.'

DEPTH	SAMPLE INFORMATION #	TYPE	FROM / TO	REC	BLOW CT ADV RATE	ELEV.	MATERIAL / DRILLING AND OTHER NOTES
							surface: Grass, weeds, coal fragments
0							
				N.R.	12 6		(No recovery - redrove split spoon)
1	1	SS	0' - 2'	1.0	10 5		6" coal fragments
					6 6		6" SILT and SAND, fine to medium, little pebble
2					9 9		moist, 7.5 YR 3/2, PID = 0
					10		7" SAME AS ABOVE, SAMPLED FOR VOCs
3	2	SS	2' - 4'	1.3'	12		8" SAND, fine to medium, some pebbles (to 1")
					12		little coarse sand and granules, trace silt
4					15		dry, 2.5 Y 6/6 PID = 0
					8		PEBBLES (to 1") and SAND, medium to coarse,
5	3	SS	4' - 6'	1.3'	12		little fine sand, little very coarse sand
					13		trace silt, dry, 5 Y 7/4, PID = 0
6					15		
					12		SAME AS ABOVE, PID = 0
7	4	SS	6' - 8'	1.4'	22		(pebbles to 3" in auger flights)
					27		
8					26		
					17		SAME AS ABOVE, PID = 0
9	5	SS	8' - 10'	1.0'	30		
					52		
10					15		END OF BORING AT 10'

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Qsource Drilling Log
Vapor Extraction Wells

Well # 1 Logged by G.Clyburn
Location 1287 Air City Drive
Dayton, Ohio
Date October 1988
Drill Co. John Mathes & Assoc.

Depths	Description
0'-18.0'	Gravel with some sand / clay
18' 22'4"	Sand and Gravel
22'4"	bottom of boring

Installation

4" sch 40 PVC
2.5' screen length
5' sand pack
natural pack 15'3" to 7'
2' hole plug
Grout to surface

Qsource Drilling Log
Vapor Extraction Wells

Well # 2 Logged by G.Clyburn
Location 1287 Air City Drive
Dayton, Ohio
Date October 1988
Drill Co. John Mathes & Assoc.

Depths	Description
0'-2'	Black clay balls (coal and silt)
2'-5'	Sand and Gravel
5'-18'	Gravel - with some sand and gravel
18'-22'	Fine Sand and small gravel, tan
22'	bottom of boring

Installation

4" sch 40 PVC
2.5' screen length
5' sand pack
1.5' hole plug
Grout to surface

Qsource Drilling Log
Vapor Extraction Wells

Well # 3 Logged by G.Clyburn
Location 1287 Air City Drive
Dayton, Ohio
Date October 1988
Drill Co. John Mathes & Assoc.

Depths	Description
0'-1'	Black coal -bank material
2'-3'	Red clay fill material
5'	organic sewer smell
22'	Sand and Gravel
22'6"	bottom of boring

Installation

4" sch 40 PVC
2.5' screen length
5' sand pack
2' hole plug
Grout to surface

Qsource Drilling Log
Vapor Extraction Wells

Well # 4 Logged by G.Clyburn
Location 1287 Air City Drive
Dayton, Ohio
Date October 1988
Drill Co. John Mathes & Assoc.

Depths	Description
1'-2'	Dark black Gravel
5'-10'	Gravel
10'-12'4"	Gravel and sand
20'	Gravel
22'	Gravel and Sand
22'	bottom of boring

Installation

4" sch 40 PVC
2.5' screen length
5' sand pack
1'4" hole plug
Grout to surface

EPA Region 5 Records Ctr.
349884

PHASE II WORK PLAN FOR INDOOR AIR SAMPLING DELINEATION AND MITIGATION BEHR VOC PLUME SITE DAYTON, OHIO

Prepared by:

DaimlerChrysler Corporation
800 Chrysler Drive
Auburn Hills, MI 48326

Prepared For:

U.S. EPA Region 5
26 West Martin Luther King Drive
Cincinnati, OH 45268

March 15, 2007

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TABLES

TABLE 1 – CONTACT LIST 21

FIGURES

Figure 1 – Behr VOC Plume and Surrounding Areas

Figure 2 – Sub-Slab Ventilation Typical Installation

ATTACHMENTS

Attachment A – Administrative Order
Attachment B – Health and Safety Plan
Attachment C – Quality Assurance Project Plan
Attachment D – Contact List
Attachment E – Canister Data Form
Attachment F – Property Information Form
Attachment G – Occupant Questionnaire
Attachment H – Indoor Air Testing Instructions
Attachment I – REAC SOP#2082
Attachment J – Air Sampling Field Form
Attachment K – Property Access and Activity Agreement
Attachment L – Project Schedule

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
CINCINNATI, OHIO 45268

February 23, 2007

RECEIVED
FEB 26 2007

Mr. Greg Rose
DaimlerChrysler Corporation
CIMS 482-00-51
800 Chrysler Drive
Auburn Hills, MI 48326-2757

Subject: Phase II Work Plan for Soil Gas Sampling and Investigation Behr VOC Plume Site, Dayton, Ohio

Mr. Rose:

The United States Environmental Protection Agency (U.S. EPA) has reviewed the Phase II Work Plan for Soil Gas Sampling and Investigation (dated February 12 and 21, 2007) for the Behr VOC Plume Site.

Pursuant to Section VIII of the Behr VOC Plume Site Administrative Order by Consent (AOC), and the enclosed modifications in Attachment A, the U.S. EPA will require a modified Work Plan for Soil Gas Sampling and Investigation for the Behr VOC Plume Site, Dayton, Montgomery County, Ohio within 5 calendar days.

If you have any questions or comments, please contact me at 513-569-7539.

Sincerely,

Steven L. Renninger
On-Scene Coordinator

Attachment

cc: Maria Gonzalez, U.S. EPA ORC
John Sherrard, Dynamac Corporation

ATTACHMENT A

MODIFICATIONS TO THE BEHR VOC PLUME SITE DRAFT PHASE II WORK PLAN (DATED 2-12-07) FOR SOIL GAS SAMPLING AND DELINEATION

Indoor air is focus of AOC.

1. **Cover Page:** Re-title Phase II Work Plan to read "Phase II Work Plan for Vapor Intrusion Investigation"

2. **Background, Page 1, 1st Paragraph, 1st Sentence:** Revise the first sentence to read "DaimlerChrysler Corporation (DCC) has prepared this Phase II Work Plan to outline the steps to be completed to conduct a vapor intrusion investigation which will determine if chlorinated volatile organic compounds (VOCs) are migrating into properties proximate to the Behr Dayton Thermal Products Facility located at 1600 Webster Street in Dayton, Ohio (Behr-Dayton facility)."

3. **Background, Page 1, 4th Paragraph, General Comment:** Add in the attachment section a copy of the September 28, 2006 correspondence to Ohio EPA.

No. these are GW.

4. **Section 4.1 Data Review, Page 6, General Comment:** In the attachments, provide a GIS aerial map of the Behr-Dayton facility showing the network of all on-site and off-site groundwater monitoring wells and provide a summary table showing all of the groundwater sampling results from each groundwater monitoring well, including sample date collected, water level data and screen depth of each monitoring well at time of sampling.

5. **Phase 2 Sampling Strategy:**

Overview

1. Establish 500-ft x 500-ft grids around the entire Behr-Dayton facility (see attached map)

2. Initially, grids will be two-deep on the northern, western and eastern perimeters
   - In Work Plan identify map showing multiple rows of grids (for display purposes)
   - Label each grid - N1, N2, S3, etc.

3. Grids will be five-deep (rows) on the southern perimeter
   - The Phase 1 Work Plan covered approximately one grid on the southern perimeter
   - Complete sub-slab sampling in remaining southern grid locations

4. At a minimum, sample 3 sub-slab locations in each grid (residential or commercial structure)

5. If all sub-slab samples (3) in a grid have a TCE concentration less than 4 ppbv, then:
   - "No Further Action" in the grid

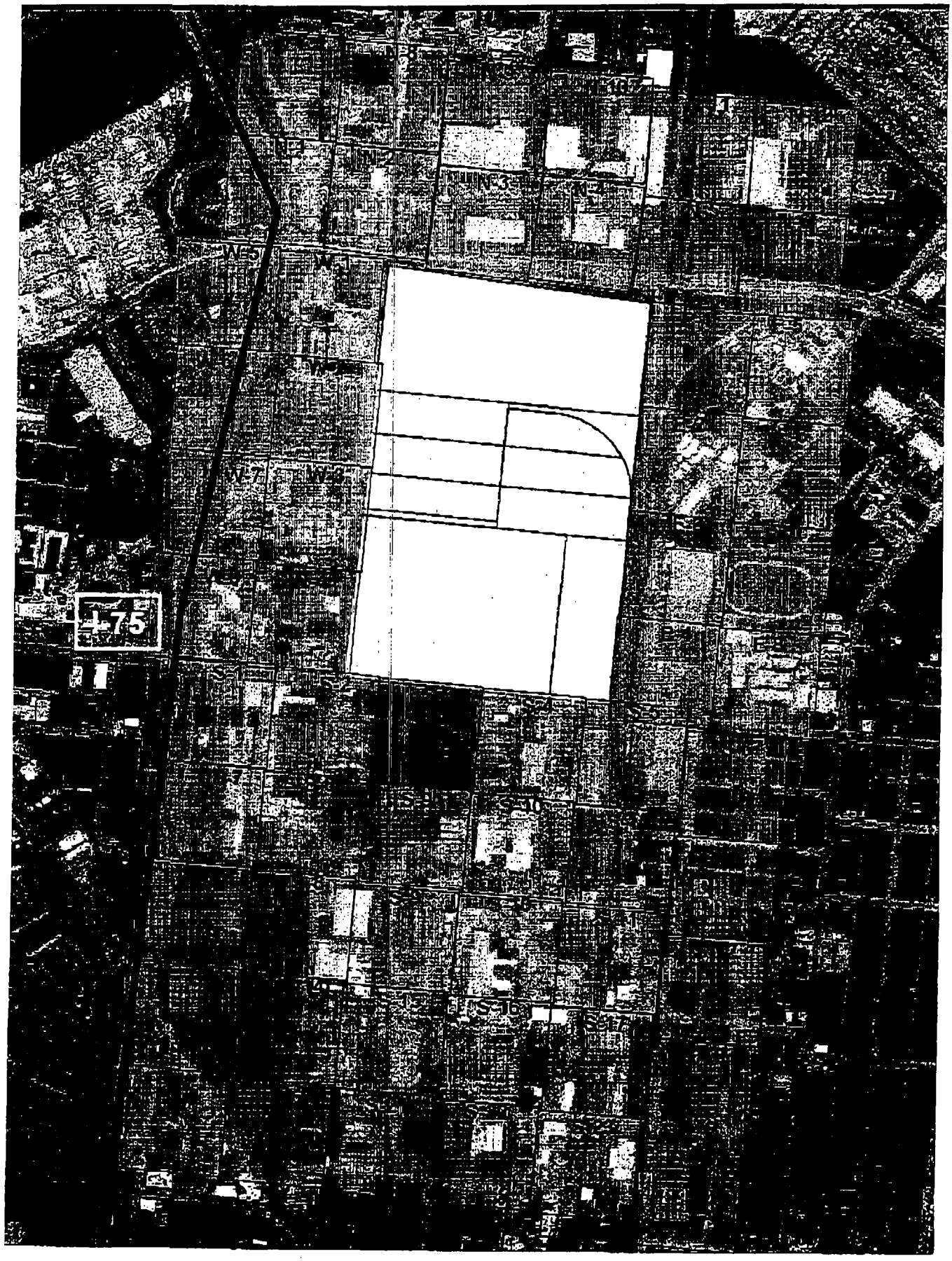
6. If a sub-slab sample (DaimlerChrysler or U.S. EPA sample) exceeds 4 ppbv TCE in a grid, then:
   - Collect Indoor Air sample at sampling locations showing sub-slab TCE concentrations greater than 4 ppbv within the grid
   - Conduct mitigation activities at sampling locations showing TCE concentrations greater than 0.4 ppbv (Residential Indoor Air) or 1.7 ppbv (Commercial Indoor Air) or industrial action levels
   - **Collect Sub-Slab samples in all remaining structures within grid (including residential, commercial, and industrial)**
   - Proceed to next grid out (away from Behr) including each diagonal grid (three total grids), return to bullet #4 for the three new grids

7. If structures are present and DaimlerChrysler cannot gain access to collect sub-slab air samples in three structures, then:
   - Proceed to the next grid out (away from Behr) including each diagonal grid, return to bullet #4 above

8. If structures are not present and DaimlerChrysler cannot collect 3 sub-slab samples in a grid, then:
   - Proceed to the next grid out (away from Behr) including each diagonal grid, return to bullet #4 above, **OR** perform all of the following:

   - Use existing groundwater wells and new groundwater wells to create three groundwater monitoring locations (temporary or permanent) per grid for sampling.
   - If all three water samples have a TCE concentration less than 5 ppb, then "No Further Action" in the grid
   - If any water sample have a TCE concentration greater than 5 ppb, then install 3 soil gas monitoring locations in the grid (two sample intervals per location – 2 feet above water table and 12 feet above water table)
   - If all 3 soil gas locations show a TCE concentration less than 40 ppbv, then "No Further Action" in grid
   - If any soil gas sample shows a TCE concentration greater than 40 ppbv, then proceed to the next grid out, including diagonally (three additional grids), and return to bullet #4 above.

VIEW OF 500-FT BY 500-FT GRIDS AROUND BEHR-DAYTON FACILITY



OhioEPA

State of Ohio Environmental Protection Agency

Southwest District Office

401 E. Fifth St.
Dayton, Ohio 45402

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Ted Strickland, Governor
Lee Fisher, Lieutenant Governor
Chris Korleski, Director

February 22, 2007

Steven L. Renninger
On-Scene Coordinator
U.S. EPA Region V
26 West Martin Luther King Drive (G41)
Cincinnati, OH 45268

RE: BEHR DAYTON THERMAL PRODUCTS LLC, MONTGOMERY COUNTY, PHASE II WORK PLAN COMMENTS

Steve:

Please consider this as a letter of support for Ohio Department of Health's (ODH) recommended "action levels" for sub-surface soil gas and groundwater for trichloroethylene (TCE), perchloroethylene (PCE), and 1,2 dichloroethene (DCE) as noted in Bob Frey's February 13, 2007, letter to you. These action levels should be used by Chrysler when performing the Phase II investigations associated with the Behr Dayton Thermal Products LLC plant in north Dayton.

Sincerely,

Jon R. Watterworth
Senior Site Coordinator
Division of Emergency and Remedial Response

ACTION LEVELS AND SCREENING LEVELS FOR CHEMICALS OF CONCERN
BEHR-DAYTON SITE, DAYTON

RESIDENTIAL LEVELS (ppb/v):

Chemical	Short-term Action Level[1] (Sub-slab)	Short-term Action Level (Indoor)	Long-term Screening Level (Sub-slab)[2]	Long-Term Screening Level (Indoor)
TCE	1,000	100	4.0	0.4
PCE	2,000	200	120	12
1,2 DCE	2,000	200	88	8.8

[1] = ATSDR Intermediate Environmental Media Evaluation Guide (EMEG) for air

[2] = US EPA Draft Vapor Intrusion Guidance Document (2002) [Target Indoor air and shallow soil gas concentrations at the 10^{-4} level]

COMMERCIAL PROPERTIES (ppb/v):

Chemical	Short-term Action Level (Sub-slab)	Short-term Action Level (Indoor)	Long-term Screening Level (Sub-slab)	Long-term Screening Level Indoor)[1]
TCE	4,200	420	**17**/*1.7*	**1.7**/*0.17*
PCE	8,400	840	**500**/*50*	**50**/*5.0*
1,2 DCE	8,400	840	370	37

[1] = US EPA Target Indoor Air concentrations [**Bolded = 10^{-4} Risk**; *Italics = 10^{-5} Risk*]

NOTE: Values adjusted for a 8-hour/day exposure

OFF-SITE "DEEP" SOIL GAS AND GROUNDWATER LEVELS (ppb/v):

Chemical	Shallow Soil Gas (= Sub-slab)	Deep Soil Gas Screening Level	Target Groundwater Screening Level
TCE	**4.1**/*0.41*	**41**/*4.1*	**5.3**/*5.0*
PCE	**120**/*12*	**1,200**/*120*	**110**/*11*
1,2 DCE	**88**/*88*	**880**/*880*	**210**/*210*

Taken from US EPA Draft Vapor Intrusion Guidance document (2002, Tables 2a/2b)

Bolded = 10^{-4} Risk; *Italics = 10^{-5} Risk*

OHIO DEPARTMENT OF HEALTH

246 North High Street
Columbus, Ohio 43215

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Bob Taft/Governor

J. Nick Baird, M.D./Director of Health

February 13, 2007

Steven L. Renninger
On-Scene Coordinator
Behr-Dayton Site
US EPA Region V
26 West Martin Luther King Drive (G41)
Cincinnati, OH 45268

Steve,

Per our conversations before the public meeting last week, I am formally presenting in this letter ODH's recommendations for deeper sub-surface soil gas and groundwater "action levels" for Trichloroethylene (TCE), Perchloroethylene (PCE), and 1,2 Dichloroethene (DCE) for the Phase II investigations associated with the Behr-Dayton (former Chrysler Air Temp) plant in north Dayton in Montgomery County. These are the same recommended levels I sent to you in an earlier e-mail dated February 6, 2007. These levels are from the same tables in the draft US EPA OSWER Guidance manual for vapor intrusion from which we obtained the "chronic" indoor air and sub-slab screening levels we are currently using for these chemicals at this site (OSWER, 2002, Tables 2a & 2b). Numbers are provided for both the 10^{-4} and 10^{-5} risk levels.

US EPA OSWER DRAFT GUIDANCE NUMBERS
SOIL GAS AND GROUNDWATER

Chemical	Shallow Soil Gas (ppb/v)	Deep Soil Gas (ppb/v)	Target Groundwater Concentration (ppb)
1,2 Dichloroethene	88/*88*	880/*880*	210/*210*
Perchloroethylene	120/*12*	1,200/*120*	110/*11*
Trichloroethylene	4.1/*0.41*	41/*4.1*	5.3/*5.0*

88 = 10^{-4} Risk Level
88 = 10^{-5} Risk Level

The rationale for using these numbers includes the desire to maintain some level of consistency in that we are already using the equivalent numbers from the same document for our indoor air and sub-slab (=Shallow Soil Gas) values for these same chemicals. The additional rationale for using numbers more conservative than those provided by Daimler-Chrysler in their draft Phase II Work Plan Report include:

1) The proximity of residential neighborhoods to the documented source area (within 2,000 ft of the former Chrysler Air Temp plant on Webster Street);

2) The high levels of TCE previously detected in groundwater under these residential communities [up to 16,000 ppb TCE in MW-029 in 2003; 9,600(2003) and 3,900 ppb (2006) TCE in MW-028; 1,300 (2003) and 3,800 ppb (2006) TCE in MW-033; and 670 (2003) and 3,900 ppb (2006) TCE in MW-038];

3) The relatively shallow depths to the water table in the area of concern [ranging between 14 - 21 ft below the ground surface based on ODNR well log reports];

4) The highly permeable nature of the intervening shallow soils (sands, gravels, and cobbles) observed in 90% of the well logs on record with ODNR for wells along Webster Street in the vicinity of the Behr plant.

and:

5) The already well-documented presence of a completed exposure pathway linking residents to TCE and 1,2 DCE in the groundwater through the vapor intrusion route in the neighborhood located just south of Leo Street, east of Webster, and west of the RR tracks [US EPA and Ohio EPA investigations of deep soil gas, sub-slab soil gas, and indoor air carried out in the area in October and November, 2006]. Levels of TCE detected in the sub-slab at concentrations as low as 49 ppb/v resulted in indoor air detections at the chronic screening level for this chemical in the indoor air (0.4 ppb/v).

We believe that these more conservative numbers for groundwater and deep soil gas will be fully protective of the public health and serve to allow Daimler-Chrysler to more completely determine the full extent of the environmental contamination associated with the release of Trichloroethylene to the groundwater at the former Chrysler Air Temp facility.

If you have any additional questions about these numbers that you want to discuss prior to the meeting on February 20th, don't hesitate to give a call at (614) 466-1069 or email me at bob.frey@odh.ohio.gov.

Sincerely,

Robert C. Frey, Ph.D.
Chief, Health Assessment Section
Bureau of Environmental Health

1. BACKGROUND

DaimlerChrysler Corporation (DCC) has prepared this Phase II Work Plan for Indoor Air Sampling, Delineation, and Mitigation to determine if trichloroethylene (TCE) vapors are migrating into properties proximate to the Behr Dayton Thermal Products Facility located at 1600 Webster Street in Dayton, Ohio (Behr-Dayton facility). This work is being performed pursuant to an Administrative Order by Consent (AOC) effective date December 19 2006, between U.S. EPA and the DaimlerChrysler Corporation. This work plan addresses "Site", identified in the AOC as the area underlain by the undefined groundwater contamination plume originating from the Behr-Dayton facility. The investigation activities are related to a trichloroethylene (TCE) contaminated groundwater plume which has migrated south-southwest of the Behr facility and beneath the properties mentioned above. Groundwater in this area is located approximately 20 feet below ground surface (bgs).

Behr Dayton Thermal Systems LLC is a Delaware limited liability company which currently owns and operates the Behr Dayton facility. Behr Dayton Thermal Systems LLC manufactures vehicle air conditioning and engine cooling systems at the facility.

DaimlerChrysler Corporation is a Delaware corporation that owned and operated the Behr Dayton facility from at least 1937 through April of 2002. DaimlerChrysler Corporation manufactured air conditioning equipment at the Behr Dayton facility. During DaimlerChrysler Corporation's ownership of the Behr Dayton facility, hazardous substances, including trichloroethene (TCE), were released at and from the Behr Dayton facility.

Earth Tech has conducted quarterly monitoring on a network of 75 on-site and off-site groundwater monitoring wells since 2001. In 2003, the following monitoring wells were sampled and contained elevated levels of TCE: MW010s (17,000 parts per billion (ppb)), MW028s (9,600 ppb), and MW029s (16,000 ppb). These monitoring wells are located along the southern perimeter of the Behr Dayton facility (MW010s) or in the adjacent neighborhood (MW028s and MW029s). On September 28, 2006, Earth Tech submitted the most recent quarterly groundwater sampling results to Ohio EPA. In the report, Earth Tech stated that one shallow groundwater monitoring well, MW038s, which is located at the intersection of Daniel Street and

Lamar Street (residential area south of the Behr Dayton facility), contained a TCE concentration of 3,900 ppb.

DaimlerChrysler Corporation contracted Earth Tech to design, install, and operate two systems for the remediation of soil and groundwater contamination under the Behr Dayton facility. Earth Tech installed a soil vapor extraction (SVE) system on the site for soil remediation and began operation in October 2003. The system was operated through December 2005. Based on extracted air concentrations, the SVE system removed a total of 900 pounds of VOCs.

Earth Tech installed a groundwater remediation system on the site and began operation in June 2004. Through December 2005, the groundwater system had removed a total of 1031 pounds of VOCs, and dechlorinated 325 pounds of VOCs.

Under the AOC, DaimlerChrysler Corporation previously conducted the following activities under a Phase I Work Plan dated January 26, 2007 approved by the U.S. EPA:

a) Developed and implemented a Site Health and Safety Plan, including an Emergency Contingency Plan.
b) Conducted sampling of subsurface soil gas within the residential properties bounded by the following geographic area: Leo Street to the north, Lamar Street to the south, Webster Street to the west, and Milburn Avenue to the east.
c) Installed interior TCE vapor abatement systems in structures impacted by TCE where applicable Indoor Air Screening Level for TCE was exceeded. Abatement systems include installation of a sub-slab vapor removal system, sealing cracks in walls and floor of the basement, and/or sealing or fixing drains that could be a pathway.
d) Developed and implemented a vapor abatement system performance sampling plan to confirm that the applicable Indoor Air Screening Level is achieved for TCE following installation of the TCE vapor abatement systems. Work under Phase I will not be complete at any structure until quarterly monitoring (4 continuous quarters) for sub-slab and indoor air is documented to be less than the applicable screening levels, following the termination of the TCE vapor abatement system operation (as directed by the EPA on-scene coordinator [OSC]).

A copy of the AOC is included in Attachment A.

Based on DaimlerChrysler's understanding of the extent of the Behr VOC Plume, this Phase II Work Plan has been prepared to delineate indoor air quality.

2. SITE MOBILIZATION

2.1 HEALTH AND SAFETY PLAN

A Health and Safety Plan (HASP) has been established for this site. The HASP provides specific guidelines and establishes procedures for the protection of personnel during the investigation and system installation activities planned at the residential properties. The HASP is based upon existing data. HASP procedures will be updated if additional information is discovered which requires alteration of the plan. The HASP is included as Attachment B.

2.1.1 Emergency Contingency Plan

An **Emergency Contingency Plan** (ECP) has been established for this site. The ECP provides specific guidelines and establishes procedures for the protection of personnel in the event of an emergency. The ECP is included as Section 9.0 of the HASP. As part of the ECP process, an update meeting will be held with local fire department and EMS personnel no more than 10 days after approval of this Work Plan.

3. QUALITY ASSURANCE PROJECT PLAN

A Quality Assurance Project Plan (QAPP) has been prepared to ensure data collected during the investigation phase is reliable. A copy of the QAPP is included as Attachment C.

4. DATA REVIEW AND SAMPLING PLAN

This work plan addresses data review, and indoor air sampling within the area of Behr VOC Plume in Dayton, Ohio. The following activities are proposed under this Work Plan:

a) Evaluate TCE concentrations in groundwater proximate to the Behr VOC Plume.
b) The aerial extent of the Behr VOC Plume is defined as:
    a. TCE in groundwater originating from the Behr Dayton facility; and
    b. TCE groundwater concentrations greater than 5 ppb.
c) Determine sub-slab TCE concentrations levels in residential properties within the Behr VOC Plume area.
d) Determine indoor air TCE concentrations in residential properties where sub-slab concentrations exceed the TCE sub-slab screening level, and in commercial and industrial properties within the Behr VOC Plume area.
e) Install sub-slab depressurization systems (SSDSs) where indoor air TCE concentrations exceed the applicable TCE Indoor Air Screening Levels for the type of property sampled, i.e. residential, commercial/community, or industrial.
f) Develop and implement a SSDS performance sampling plan to confirm that applicable Indoor Air Screening Levels are achieved for TCE following installation of the TCE SSDS.

4.1 DATA REVIEW

The existing regional groundwater data in the vicinity of the Behr-Dayton facility will be reviewed to determine the extent of TCE impacts originating from the Behr-Dayton facility. The current understanding of the Behr VOC Plume Boundary, as conceded by EPA during the March 12, 2007 meeting (pending completion of the "Behr VOC Plume Groundwater Report"), is illustrated in Figure 1, along with surrounding areas. The groundwater review will be conducted to further define the "Site" for purposes of the response actions required under the AOC to be performed pursuant to this Work Plan. As mentioned above, a "Behr VOC Plume Groundwater Report" summarizing the data review, and confirming the geography of the Behr VOC Plume will be provided to U.S. EPA within 30 days of submittal of this Phase II Work Plan. In the event that the data review modifies the current understanding of the aerial extents as defined in Figure 1, a Phase III Work Plan will accompany the Behr VOC Plume Groundwater Report including the modified extents.

4.2 PRIVATE PROPERTY SAMPLING

Upon approval by the OSC, a combination of indoor air sampling and subsurface slab air sampling will be conducted at properties within the area shown on Figure 1 – Behr VOC Plume. The samples will be analyzed for TCE utilizing U.S. EPA Method TO-15. These samples will be used to determine if a SSDS installation is necessary. The sampling procedure and methodology are detailed in the following sections.

4.2.1 Access Requests

To ensure "best efforts" are made to gain access to the properties noted above, the following steps will be taken to request access:

1. Mailing – Within 5 days of notification by OSC that access to a property is necessary, a mailing will be delivered to each property outlining the issues noted in the neighborhood and requesting a meeting to discuss the work that needs to be completed. The mailing will include contact information and a brief discussion of sampling activities to be conducted.
2. Visit – Within 10 days of the mailing, if there is no response to the mailing or if access is denied, the Montgomery County Health Department and/or DCC personnel will attempt to contact the occupants and/or property owner in person.
3. Certified Letter – Within 10 days of the site visit, if attempts to contact the occupant/owner in person are unsuccessful or if access is denied, a certified letter will be mailed to the occupant/owner outlining the work to be completed.
4. Certified Letter #2 – If there is no response to the first certified letter or if access is denied within 10 days of receipt, a second certified letter will be mailed to the occupant/owner further encouraging that access be granted.
5. Notify U.S. EPA – In the event there is no response using the 4 steps above, or if access is denied, the U.S. EPA will be notified within 10 days that "best efforts" to gain access to the property have been unsuccessful.

All contact with the occupants/owners will be documented and logged. A contact list similar to the example included as Attachment D will be used to log contact. In the event that an owner denies access, an attempt will be made by DaimlerChrysler Corporation to obtain a written signature on the access agreement noting that the owner is denying access.

4.2.2 Residential Indoor Air Sampling

Upon direction by the OSC, one indoor air sample and one subsurface slab sample will be collected at residential properties within the Behr VOC Plume as shown on Figure 1. The results from the samples collected from the residences will be reviewed, and an SSDS will be installed if indoor air results exceed the residential TCE Indoor Air Screening Level of 0.4 ppbv, and the subsurface slab results exceed the subsurface slab residential TCE screening level of 4 ppbv.

4.2.3 Industrial Indoor Air Sampling

One indoor air sample will be collected at industrial facilities within the Behr VOC Plume as shown on Figure 1. The results from the samples collected from the industrial facilities will be reviewed, and an SSDS will be installed if indoor air results exceed the Occupational Safety and Health Administration (OSHA) permissible exposure level (PEL) of 100 ppm.

4.2.4 Commercial/Community Facility Indoor Air Sampling

One indoor air sample will be collected at commercial and community facilities within the Behr VOC Plume as shown on Figure 1. Community facilities include schools, churches, and publicly owned properties available for public use. The results from the samples collected from the commercial/community facilities will be reviewed, and a subsurface slab sample will be collected if indoor air results exceed the indoor air screening level of 1.7 ppb. If indoor air results exceed the indoor air commercial TCE screening level of 1.7 ppbv, and the subsurface slab results exceed the subsurface slab commercial TCE screening level of 17 ppbv, a SSDS will be installed.

4.3 SAMPLING PROTOCOL

4.3.1 Sample Types

Subsurface Slab Samples

One subsurface slab sample will be collected from each residential property and select commercial/community properties.

Indoor Air Samples

One indoor air sample will be collected from each property.

Blank Sample

One blank canister will be submitted to the laboratory in each week that indoor air samples are collected as a trip blank. Canisters will be transported from the laboratory to the field and returned to the laboratory with other analytical samples.

Ambient Air Sample

One ambient air sample will be collected on each day that indoor air sampling is conducted. The location of the ambient air sample will be outdoors, upwind of the area being sampled. Results from the ambient air sampling will be deducted from the indoor air results obtained during the same period prior to comparison to screening levels.

Co-located Sample

Co-located samples may be collected from an indoor air sample location. The sample ports will be placed side by side.

4.3.2 Information Acquisition

Various types of information will be obtained and recorded for the purposes of this evaluation. Data/information forms to be used are listed below.

- Canister Data Form: Used to record data on the condition of the canisters, sampling times, vacuum, etc. (Attachment E).
- Property Information Form: Used to record site specific information about property features that may help in the interpretation of the analytical data (Attachment F), including photographic documentation.
- Occupant Questionnaire: Used to record information that may provide insight into sources of chemicals within the property that may be detected in the air samples (Attachment G).
- Indoor Air Testing Instructions: Instructions will be provided as information to occupants regarding the steps that should be taken to help ensure the integrity of the air samples (Attachment H).

4.3.3 Sampling Methodology

Sampling methodology will be consistent with U.S. EPA protocols for the collection of air samples using TO-15 Summa™ canister sampling and analysis methodology (U.S. EPA 1999) or U.S. Occupational Safety and Health Agency (OSHA) protocols for the collection of TCE air samples using OSHA Method 1001 charcoal tube methodology (U.S. OSHA, May 1999). Sampling for each air sampling type is discussed below. Each canister will be certified cleaned by the selected laboratory according to its QAPP and U.S. EPA Method TO-15. Each charcoal tube will be analyzed consistent with OSHA Method 1001. For the analytical testing, TO-15 SIM will be used for the residential and commercial indoor air samples to obtain lower detection limits for chlorinated solvents. Severn Trent Laboratories (STL) and/or Lancaster Laboratories will conduct the analytical work for the site. Baseline indoor air samples from all properties will be analyzed with rush turn around times (24-48 hours) requested; baseline subsurface slab samples and all sampling subsequent to installation of treatment systems will be analyzed with standard turn around times requested.

4.3.4 Subsurface Slab Sampling

Subsurface Slab sample ports will be installed and sampled in accordance with the Response Engineering and Analytical Contract (REAC) SOP #2082. A copy of the SOP is included in Attachment I. Note that a vacuum equipped with a HEPA filter may be used during installation activities to minimize impact to the occupants.

Sample Collection

Subsurface Slab samples will be collected using 6-liter Summa™ canisters fitted with a flow orifice pre-calibrated to collect a 6-liter sample over a twenty-four hour period. Once the 24-hour sampling period is completed, the Summa™ canisters will be boxed and shipped to the laboratory for analyses of TO-15 SIM analytes. A brief outline of the sampling protocol is provided below.

At the start of the sampling event, a pressure gauge reading will be performed. Values will be recorded. Flow rates will be less than 200 mL/min and sampling will continue until a complete 24-hour sample has been collected. At the end of the sampling event, a pressure gauge reading will be performed. Values will be recorded. If the final volume of sample is greater than 4-liters, and the canister is still under vacuum (>2 in. Hg), the sample will be considered valid.

The 6-liter Summa™ canister with a calibrated 24-hour orifice will be connected to the stainless steel vapor probe using Teflon™ tubing. Note that collection with a calibrated orifice will ensure that the flow rate is not greater than 200 mL/min, which is the flow threshold above which VOC stripping from soil might occur (CalEPA 2003). After the sample is collected, the safety cap will be installed.

All data concerning sample collection will be documented in a field notebook and the samples will be handled as documented under the QAPP.

4.3.5 Indoor Air Sampling

A physical survey of the buildings to be sampled will be conducted, in conjunction with an interview of the occupants of the buildings. The purpose of the physical survey is to obtain data that will allow a qualitative assessment of factors that potentially could influence indoor air quality. The physical survey includes collecting information on aspects of the building configuration such as building layout, attached garages, utility entrances into the building, ventilation system design, foundation conditions, presence of foundation sump, building material types (e.g. recent carpeting/linoleum and/or painting), presence of fireplace, location of laundry facilities, etc. The physical survey also includes collecting data related to indoor air quality such as use of cleaning products, dry-cleaner use, carpet cleaning services, indoor storage of paints and/or petroleum hydrocarbon products, use of aerosol consumer products, smoking, hobby crafts, etc. During the physical survey, the basement will be pre-screened with a PPB-RAE to determine if any chemicals may be present in the sampling area.

Occupants will be requested to keep out of the sampling area during the sampling event, if possible.

4.3.5.1 Indoor Air Sampling – Summa™ Canister

The residential and commercial indoor air samples, and some industrial indoor air samples will be collected using a Summa™ canister (6-liter capacity) equipped with a critical orifice flow regulation device sized to allow the collection of an air sample over a 24-hour sampling period. Samples will be collected from the lowest inhabitable level of the building in order to determine the potential for vapors to enter the breathing zone of the occupants. Care will be taken to

deploy the Summa™ canisters away from the direct influence of any forced air emanating from air conditioning units, central air conditioning vents, furnaces or heaters.

The indoor air sampling procedure is described as follows:
Building spaces will be examined to determine a location for deployment of the Summa™ sample canister as close as practical to the center of the space. The location will be representative of the breathing zone or approximately one to two meters above the floor level. An attempt will be made deploy the canister in areas that are not subject to disturbances or locations that interfere with the occupant's normal activities.

Air sample canisters will be labeled with a unique sample designation number. Both the sample number and the sample location information will be recorded on the Indoor Air Sampling Field Form (Attachment J).

The Summa™ canister vacuum will be measured using an integrated vacuum gauge immediately prior to canister deployment, and recorded on the Indoor Air Sampling Field Data Sheet. The critical orifice flow controller will be installed, as supplied by the laboratory, on the canister and the canister will be opened fully at the beginning of sample collection period and start time recorded on the Indoor Air Sampling Field Data Sheet.

Other data recorded on the Indoor Air Sampling Field Data Sheet will include: outside and interior temperatures both at the start and end of the sample period, basement depth, equipment serial numbers, sampler name, and any comments. Photographic documentation of the sampling event will be conducted, including the address of the sampling event, if permitted by the property owner, and summarized on the Occupant Information Form.

The canister valve will be closed fully at the end of the sample period (after 24 hours) and the end time recorded on the field data sheet. If there is evidence of canister disturbance during the sample collection, this will be recorded on the Indoor Air Sampling Field Data Sheet.

The Summa™ canister vacuum will be measured immediately after canister retrieval at the end of the sample period and recorded on the field data sheet. Samples will be rejected (ie. not analyzed) if the canister has been observed to have reached atmospheric pressure. Once the

vacuum is measured, the safety cap will be securely tightened on the inlet of the Summa™ canister. Field data will be verified as correctly entered into field books prior to shipment and canisters will be shipped to the laboratory under a chain of custody.

4.3.5.2 Industrial Indoor Air Sampling – Charcoal Tube

Some industrial indoor air samples will be collected using charcoal tubes and personal sampling pumps. The sampling procedure for charcoal tubes is presented below.

4.3.5.2.1 Apparatus

Samples are collected with 7-cm × 4-mm i.d. × 6-mm o.d. glass sampling tubes packed with two sections of coconut shell charcoal. The tubes contain 100 mg of adsorbent in the front section and 50 mg in the back section. The adsorbent sections are held in place with glass wool plugs and are separated by urethane foam plugs. The ends of the glass sampling tubes are heat sealed.

Samples are collected using personal sampling pumps that have been calibrated, with sampling devices attached, to within ±5% at the recommended flow rate of 50 mL/min. The charcoal tubes are connected to the pumps with flexible, non-crimpable tubing.

4.3.5.2.2 Methodology

Immediately before sampling, break off the ends of the charcoal tube. Connect the sampling tube to the sampling pump with flexible, non-crimpable tubing. Position the tube so that sampled air first passes through the larger adsorbent section. Air being sampled should not pass through any hose or tubing before entering the sampling tube. To avoid channeling, place the sampling tube vertically in the breathing zone. After sampling for 240 minutes, immediately remove the sampling tube and seal it with plastic caps. Submit at least one blank sampling tube with each sample set. Blanks should be handled in the same manner as samples, except no air is drawn through them. Record air volume (in liters), sampling time (minutes) and sampling rate (mL/min) for each sample. Also, list any compounds that could be considered potential interferences, especially solvents, which are being used in the sampling area.

4.4 REPORTING

4.4.1 Behr VOC Plume Groundwater Report

Upon completion of the groundwater data review, a report will be prepared that summarizes the regional groundwater conditions that define the Behr VOC Plume.

The report will be submitted to the U.S. EPA 30 days after submittal of this Phase II Work Plan.

4.4.2 Investigation Technical Memorandum

Upon completion of the investigation, a technical memorandum detailing the findings of the sampling will be prepared. Items to be presented in the report include:

- Documentation of the field sampling event
- Evaluation of the resulting data
- Calibration Data
- Laboratory Analytical Data and Chain of Custody
- Conclusions

The technical memorandum will be submitted to the U.S. EPA 30 days after receipt of validated lab data from all sampling locations. Three hard copies and one electronic PDF file will be provided.

4.4.3 Progress Update Meetings

A periodic conference call will be held as needed to discuss the progress of the Phase II Work Plan. The following representatives will be invited to participate in the call:

- DaimlerChrysler Project Staff
- EPA OSC
- EPA START
- Earth Tech
- Ohio EPA
- Ohio Department of Health
- Montgomery County Health Department

DaimlerChrysler will arrange a conference call bridge, and distribute a call reminder with the latest project status prior to the call. The conference call agenda may include:

1) Latest Validated Sample Results (Project Status Spreadsheet)
2) SSDS Installation Status and Installation times/date
3) Plans for the next week
4) Project Issues

5. SYSTEM INSTALLATION

In the event that validated test results from indoor air sampling of properties sampled under Task 3 are higher than the applicable TCE Indoor Air Screening Level for the type of property sampled, i.e. residential, commercial/community, or industrial, a SSDS will be installed in those properties, if access is granted by the property owner.

Access agreements should be retained for each property. A sample Property Access and Activity Agreement is included in Attachment K.

The objective of the depressurization systems is to reduce exposure of the building occupants to elevated indoor air concentrations of TCE within the properties. DaimlerChrysler Corporation will work closely with the contractors responsible for the installation of the systems to ensure proper installation and operation of the systems. A description of the technology and installation procedures is outlined in the following sections.

5.1 SYSTEM CHARACTERISTICS

Sub-slab depressurization technology consists of the creation of a suction point located in the basement connected to a high static suction fan. The suction fan will be mounted outdoors and will be mounted directly on the system piping and fastened to a supporting structure by means of mounting brackets. On average, the suction fan will provide coverage of 2,000 square feet per slab penetration. This coverage may vary depending upon the sub-slab material. In general, the tighter the material, the smaller the area covered per slab penetration. The suction fan will operate continuously to vent the subsurface beneath the basement slab.

5.2 SYSTEM INSTALLATION

Installation of the sub-slab depressurization system will be conducted by Air Quality Control Agency, a knowledgeable contractor with experience in installing similar systems in the Dayton, Ohio area. The contractor shall follow the methods outlined in *ASTM Standard E 2121-03 – Standard Practice for Installing Radon Mitigation Systems in Existing Low-Rise Residential Buildings.* Prior to installing the mitigation system, DaimlerChrysler Corporation and the contractor will consult with the occupant and evaluate the property to determine the most

effective and convenient location. All local building codes shall be followed during installation of the system.

Installation will begin with the creation or determination of a sub-slab suction point within the basement of each property. A portion of the basement slab will be cored and/or saw-cut using a concrete coring tool, saw or other appropriate tool, and the concrete removed. A small excavated hole will be created in the sub-slab material where the end of the suction point pipe will be placed. The size of the excavated hole will vary depending on the permeability of the sub-slab material. 3-inch diameter Schedule 40 polyvinyl chloride (PVC) piping will be routed from the suction point, through the slab and outside the basement through a wall penetration. The pipe will then be connected to a suction fan and the exhaust piping will be routed to the roof-line, taking care to exhaust the air above any nearby intake pipes or building windows.

Any openings around the suction point penetration, utility penetrations, and other openings in the slab will be appropriately sealed.

The power supply for the fan will be locked to prevent accidental shut-off of the system. Residents will be supplied with a key to allow for the power to be turned off for maintenance purposes. A typical sub-slab depressurization system is illustrated in Figure 2.

A permanent vacuum gauge will be installed on each system on the suction side of the fan. Following startup of the system, an initial vacuum reading will be recorded.

5.3 OPERATION AND MAINTENANCE MANUAL

Following installation activities, an operation and maintenance manual will be supplied to each property owner. In addition, keys to the power supply for the fan will also be supplied to each property. Contents of the operation and maintenance manual will include, but not be limited to, the following information:

- Operator's manual for the system
- Contact information sheet
- System life expectancy
- Pre and post installation sampling results
- Photographic documentation (if available)
- Copy of the Access Agreement (if available)

- Link to the U.S. EPA website
- Warranty information

6. POST SYSTEM INSTALLATION MONITORING

Post system installation monitoring will be conducted to ensure proper operation of the sub-slab depressurization systems. All monitoring will be conducted in accordance with the sampling procedures outlined in Section 4.0: Sampling Plan.

Following system installation activities, indoor air and sub-slab air sampling will be conducted at the properties on the following timeline:

- Initial post system installation sample will be taken within approximately 10 days of installation completion
- The second sample will be taken within approximately 30 days of the initial post system installation sample
- The third sample will be taken within approximately 180 days of the initial post system installation sample
- The fourth sample will be taken within approximately 1 year of the initial post system installation sample
- Sampling will be scheduled and completed annually following the first year

The TCE SSDS operation will continue until it is determined by the EPA OSC that the system can be shut down. Following termination of the system operation, sampling events will be conducted on a quarterly basis. Work under Phase II will not be complete at any structure until quarterly monitoring (4 continuous quarters) for sub-slab and indoor air is documented less than the applicable screening levels, following the termination of the TCE vapor abatement system operation.

In the event that access is denied for post system installation monitoring, DaimlerChrysler Corporation will notify the U.S. EPA and Montgomery County Health Department that follow up sampling cannot be completed due to access denial.

Copies of the monitoring data will be submitted to the U.S. EPA and the Montgomery County Health Department. In addition, results will be forwarded to each property for inclusion in their Operation and Maintenance manual.

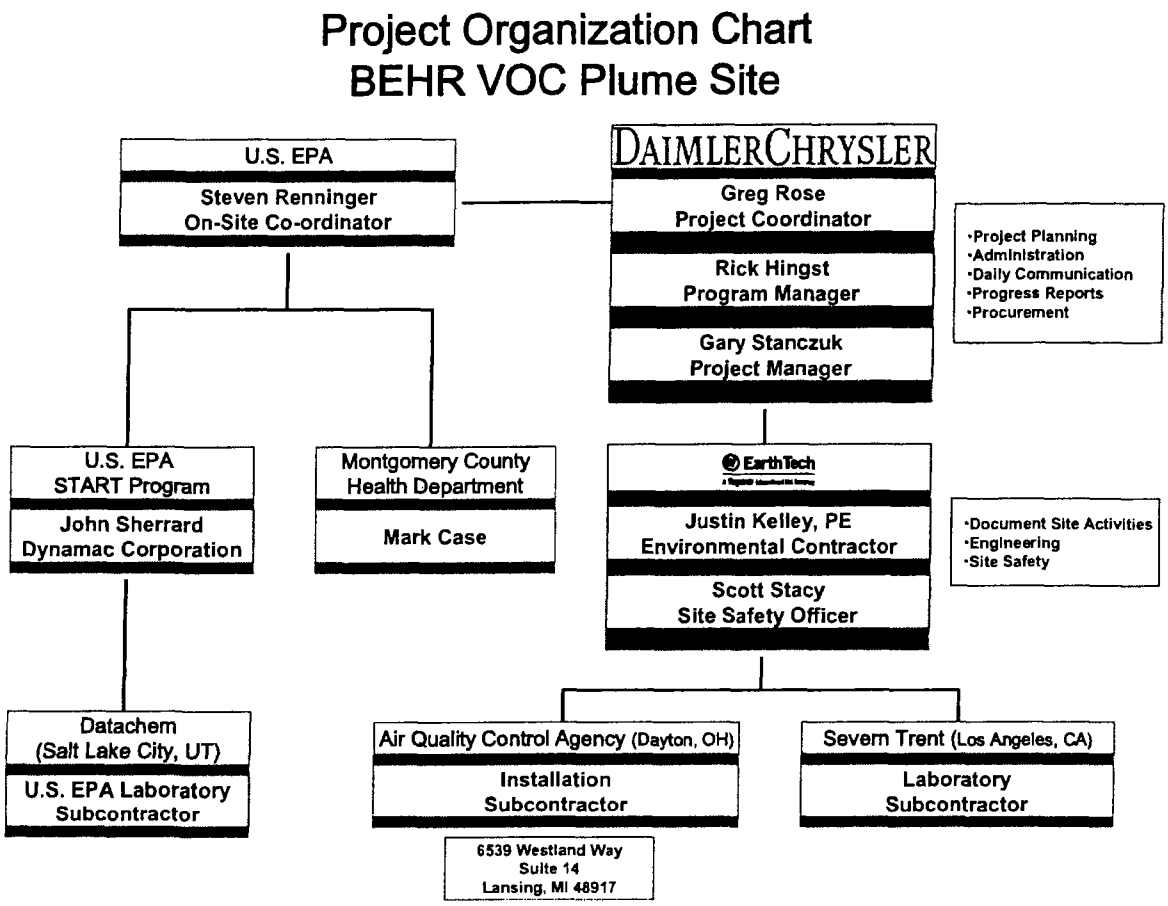
During each sampling event, an inspection of the system will be conducted. System inspection activities will include:

- System vacuum/pressure readings
- Confirm operation of the blower fan
- Visual inspection of system piping and components
- Inspect floor and wall seals
- Confirm operation with occupants

7. PROJECT MANAGEMENT

7.1 RESPONSIBILITIES AND FUNCTIONS

The work outlined in this work plan will be managed as per the following project organization chart.



Contact numbers for each member are given in Table 1.

Table 1 – Contact List

Contact Name	Phone #
Steven Renninger (U.S. EPA)	(513) 569-7539
John Sherrard (Dynamac)	(513) 703-3092
Mark Case (Montgommery County Health Department)	(937) 225-4429
Greg Rose (DCC)	(248) 576-7362
Rick Hingst (DCC)	(248) 576-7371
Gary Stanczuk (DCC)	(248) 576-7365
Justin Kelley (Earth Tech)	(734) 779-0364
Scott Stacy (Earth Tech)	(734) 779-2819
Jamey Gelina (Air Quality Control Agency)	(800) 420-3881

7.2 PROJECT SCHEDULE

A general project schedule has been included in Attachment L.

FIGURES

Figures

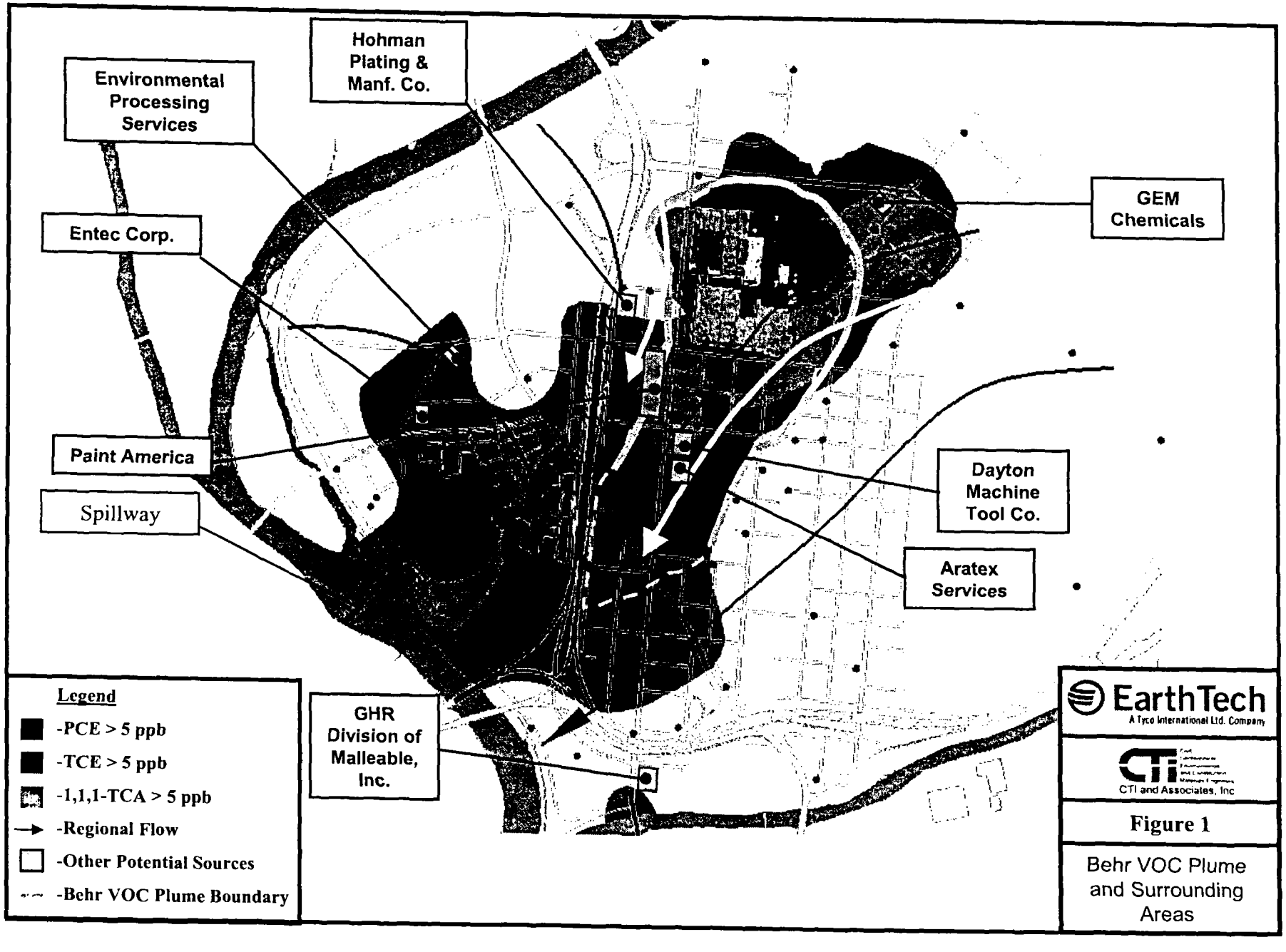
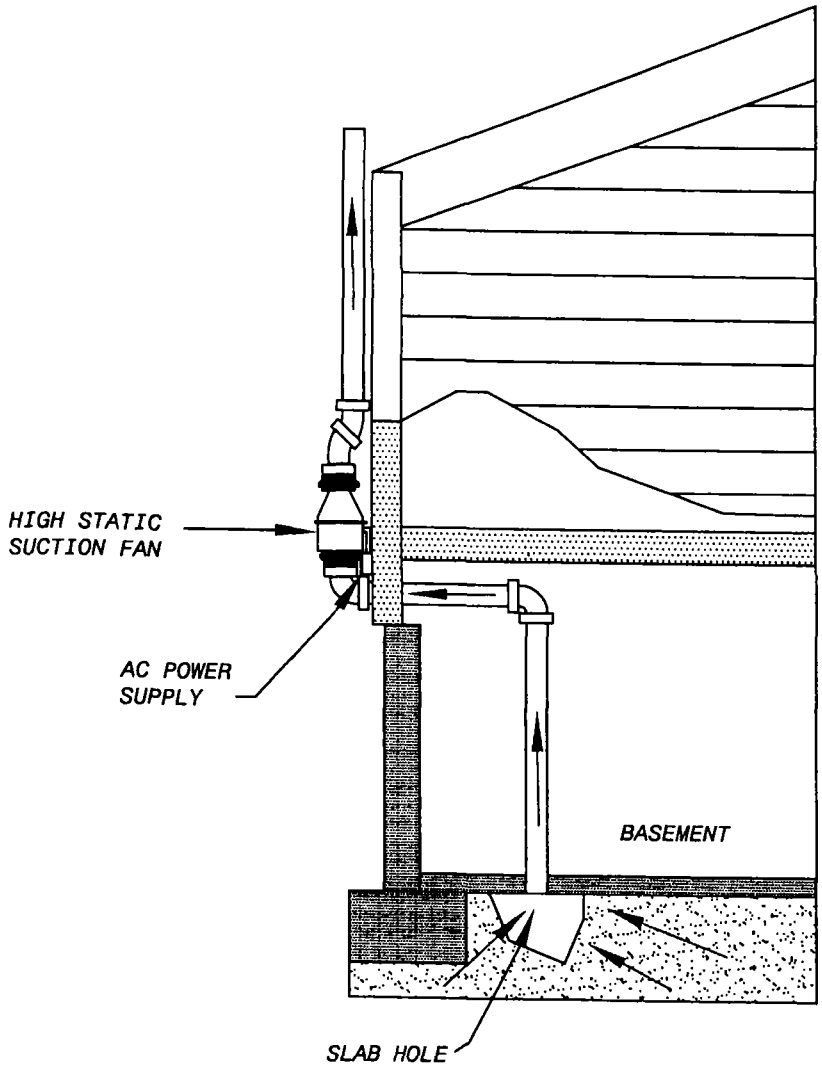


Figure 1

Behr VOC Plume and Surrounding Areas



EarthTech

A Tyco International Ltd. Company

DRAWN BY: VM	DATE: NOVEMBER 2006
CHECKED BY: SC	EDITED BY: VM111606
FILE NAME: Sub Slab Schematic.dwg	

FIGURE NO. 2

SUB–SLAB VENTILATION
TYPICAL INSTALLATION

DAYTON THERMAL PRODUCTS
DAYTON, OHIO

PROJECT NUMBER 63787	SCALE: NOT TO SCALE

ATTACHMENT A

Attachment A

Administrative Order

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 5

IN THE MATTER OF: Behr VOC Plume Site Dayton, Montgomery County, Ohio	ADMINISTRATIVE SETTLEMENT AGREEMENT AND ORDER ON CONSENT FOR REMOVAL ACTION
	Docket No. _____
Respondent: Daimler Chrysler Corporation	Proceeding Under Sections 104, 106(a), 107 and 122 of the Comprehensive Environmental Response, Compensation, and Liability Act, as amended, 42 U.S.C. ' ' 9604, 9606(a), 9607 and 9622

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I. JURISDICTION AND GENERAL PROVISIONS

1. This Administrative Settlement Agreement and Order on Consent (ASettlement Agreement@) is entered into voluntarily by the United States Environmental Protection Agency (AU.S. EPA@) and Daimler Chrysler Corporation ("DCC"), hereinafter the Respondent. This Settlement Agreement provides for the performance of removal actions by Respondent and the reimbursement of certain response costs incurred by the United States at or in connection with the property located in the vicinity of 1600 Webster Street in Dayton, Montgomery County, Ohio, the ABehr VOC Plume Site,@ the "BVP Site" or the ASite.@ The Site is described further in Section III, Paragraph 8(j) of this Settlement Agreement.

2. This Settlement Agreement is issued under the authority vested in the President of the United States by Sections 104, 106(a), 107 and 122 of the Comprehensive Environmental Response, Compensation, and Liability Act of 1980, 42 U.S.C. ' ' 9604, 9606(a), 9607 and 9622, as amended (ACERCLA@). This authority has been delegated to the Administrator of the U.S. EPA by Executive Order No. 12580, January 23, 1987, 52 Federal Register 2923, and further delegated to the Regional Administrators by U.S. EPA Delegation Nos. 14-14-A, 14-14-C and 14-14-D, and to the Director, Superfund Division, Region 5, by Regional Delegation Nos. 14-14-A, 14-14-C and 14-14-D.

3. U.S. EPA has notified the State of Ohio (the AState@) of this action pursuant to Section 106(a) of CERCLA, 42 U.S.C. ' 9606(a).

4. U.S. EPA and Respondent recognize that this Settlement Agreement has been negotiated in good faith and that the actions undertaken by Respondent in accordance with this Settlement Agreement do not constitute an admission of any liability. Respondent does not admit, and retains the right to controvert in any subsequent proceedings other than proceedings to implement or enforce this Settlement Agreement, the validity of the findings of facts, conclusions of law, and determinations in Sections IV (Findings Of Fact) and V (Conclusions Of Law And Determinations) of this Settlement Agreement. Respondent agrees to comply with and be bound by the terms of this Settlement Agreement and further agrees that Respondent will not contest the basis or validity of this Settlement Agreement or its terms.

II. PARTIES BOUND

5. This Settlement Agreement applies to and is binding upon U.S. EPA and upon Respondent and its successors and assigns. Any change in ownership or corporate status of the Respondent including, but not limited to, any transfer of assets or real or personal property shall not alter the Respondent=s responsibilities under this Settlement Agreement.

6. Respondent is jointly and severally liable for carrying out all activities required by this Settlement Agreement.

7. Respondent shall ensure that its contractors, subcontractors, and representatives

comply with this Settlement Agreement. Respondent shall be responsible for any noncompliance with this Settlement Agreement except noncompliance by U.S. EPA, U.S. EPA contractors, the Ohio Environmental Protection Agency (Ohio EPA), or Ohio EPA's contractors.

III. DEFINITIONS

8. Unless otherwise expressly provided herein, terms used in this Settlement Agreement which are defined in CERCLA or in regulations promulgated under CERCLA shall have the meaning assigned to them in CERCLA or in such regulations. Whenever terms listed below are used in this Settlement Agreement or in the appendices attached hereto and incorporated hereunder, the following definitions shall apply:

a. ACERCLA@ shall mean the Comprehensive Environmental Response, Compensation, and Liability Act of 1980, as amended, 42 U.S.C. ' ' 9601, *et seq.*

b. AEffective Date@ shall be the effective date of this Settlement Agreement as provided in Section XXX (Effective Date).

c. AResponse Costs@ shall mean all costs, including direct and indirect costs, that the United States incurs in reviewing or developing plans, reports and other items pursuant to this Settlement Agreement, verifying the Work, or otherwise implementing, overseeing, or enforcing this Settlement Agreement on or after the Effective Date. Response Costs shall also include all costs, including direct and indirect costs, that the United States incurred at or in connection with the Site during the period beginning on September 25, 2006 and ending on the Effective Date.

d. AInterest@ shall mean interest at the rate specified for interest on investments of the U.S. EPA Hazardous Substance Superfund established by 26 U.S.C. ' 9507, compounded annually on October 1 of each year, in accordance with 42 U.S.C. ' 9607(a). The applicable rate of interest shall be the rate in effect at the time the interest accrues. The rate of interest is subject to change on October 1 of each year.

e. ANational Contingency Plan@ or ANCP@ shall mean the National Oil and Hazardous Substances Pollution Contingency Plan promulgated pursuant to Section 105 of CERCLA, 42 U.S.C. ' 9605, codified at 40 C.F.R. Part 300, and any amendments thereto.

f. ASettlement Agreement@ shall mean this Administrative Settlement Agreement and Order on Consent and all appendices attached hereto (listed in Section XXIX (Severability/Integration/Attachments)). In the event of conflict between this Settlement Agreement and any appendix, this Settlement Agreement shall control.

g. AParties@ shall mean U.S. EPA and Respondent.

h. ARCRA@ shall mean the Solid Waste Disposal Act, as amended, 42 U.S.C. ' ' 6901, *et seq.* (also known as the Resource Conservation and Recovery Act).

i. ARespondent@ shall mean Daimler Chrysler, a Delaware Corporation.

j. ASite@ shall mean the Behr VOC Plume Superfund Site, encompassing the areal extent of the undefined groundwater contamination plume originating from the Behr-Dayton Thermal Systems LLC facility (the Behr-Dayton facility) located at 1600 Webster Street, Dayton, Montgomery County, Ohio, and a residential area south of the Behr-Dayton facility, including but not limited to Daniel Street, Lamar Street, and Milburn Avenue and depicted generally on the map attached as Attachment B.

k. AState@ shall mean the State of Ohio.

l. AU.S. EPA@ shall mean the United States Environmental Protection Agency and any successor departments or agencies of the United States.

m. AWaste Material@ shall mean 1) any Ahazardous substance@ under Section 101(14) of CERCLA, 42 U.S.C. ' 9601(14); 2) any pollutant or contaminant under Section 101(33) of CERCLA, 42 U.S.C. ' 9601(33); 3) any Asolid waste@ under Section 1004(27) of RCRA, 42 U.S.C. ' 6903(27); and/or 4) any Ahazardous waste@ under Ohio Revised Code Chapter 3734.01(j).

n. AWork@ shall mean all activities Respondent is required to perform under this Settlement Agreement.

IV. FINDINGS OF FACT

9. Based on available information, including the Administrative Record in this matter, U.S. EPA hereby finds that:

a. The Behr-Dayton facility is located at 1600 Webster Street, Dayton, Montgomery County, Ohio, near a residential area, and approximately 1 mile north of the Downtown Dayton.

b. Behr-Dayton Thermal Systems LLC is a Delaware limited liability company which currently owns and operates the Behr-Dayton facility.

c. Behr Dayton Thermal Systems LLC manufactures vehicle air conditioning and engine cooling systems at the facility.

d. Respondent Daimler Chrysler Corporation ("DCC") is a Delaware corporation that owned and operated the Behr-Dayton facility from at least 1937 until April of 2002.

e. Respondent DCC manufactured air conditioning equipment at the Behr-Dayton facility.

f. During Respondent's ownership of the Behr-Dayton facility, hazardous substances, including trichloroethene (TCE), were released at and from the Behr-Dayton facility.

g. The groundwater beneath the Behr-Dayton facility is contaminated with volatile organic compounds, including trichloroethene (TCE).

h. TCE is a hazardous substance within the meaning of Section 101 (14) of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA). It is a "listed hazardous substance" as that term is defined at 40 CFR § 302.4, and is included in Table 302.4 as a hazardous substance designated under Section 102(a) of CERCLA.

i. TCE is a man-made chemical that is widely used as a cleaner to remove grease from metal parts.

j. The Agency for Toxic Substances and Disease Registry ("ATSDR") reports that inhalation exposure to TCE at very high concentrations may affect the central nervous system, with symptoms such as dizziness, headaches, confusion, euphoria, facial numbness, and weakness.

k. ATSDR and the Ohio Department of Health ("ODH") have established TCE screening and action levels for residential and commercial sub-slab and indoor air. The ATSDR residential indoor air screening level is 0.4 parts per billion (ppb) and the action level is 100 ppb. The ATSDR residential sub-slab screening level is 4 ppb and the action level is 1,000 ppb. The ATSDR commercial sub-slab screening level is 17 ppb. The ATSDR commercial indoor air screening level is 1.7 ppb. The U.S. Department of Labor, Occupational Safety and Health Administration ("OSHA") has established an employee exposure limit of 100 parts per million (ppm) (8-hour time weighted average), with an acceptable ceiling concentration of 200 ppm and an acceptable maximum peak concentration of 300 ppm above the acceptable ceiling level concentration for an 8-hour shift, with a maximum duration of 5 minutes in any 2 hours. (See 29 CFR 1910.1000 Table Z-2.)

l. Respondent contracted Earth Tech to design, install, and operate two systems for the remediation of soil and groundwater contamination under the Behr-Dayton facility, with TCE as the main contaminant of concern. Earth Tech installed a Soil Vapor Extraction (SVE) system on the Behr-Dayton facility property for soil remediation and began operation in October 2003. The system was operated through December 2005. Based on the extracted air concentrations, the SVE system removed a total of 900 pounds of VOCs.

m. Earth Tech installed a groundwater remediation system on the Behr-Dayton facility property and began operation in June 2004. Through December 2005, the groundwater system had removed a total of 1031 pounds of VOCs, and dechlorinated 325 pounds of VOCs.

n. The TCE contaminated ground water has migrated to the South to a residential area located across Leo Street from the Behr-Dayton facility, including but not limited to Daniel Street, Lamar Street, and Milburn Avenue.

o. Earth Tech has conducted quarterly monitoring on a network of 75 on-site and off-site groundwater monitoring wells since 2001. In 2003, the following monitoring wells were sampled and contained elevated levels of TCE: MW010s (17,000 ppb), MW028s (9,600 ppb), and MW029s (16,000 ppb). These monitoring wells are located along the southern perimeter of the Behr-Dayton facility (MW010s) or in the adjacent neighborhood (MW028s and MW029s).

p. On September 28, 2006, Earth Tech submitted the most recent quarterly groundwater sampling results to Ohio EPA. In the report, Earth Tech stated that one shallow groundwater monitoring well, MW038s, which is located at the intersection of Daniel Street and Lamar Street (residential area south of Behr Dayton facility), contained a TCE concentration of 3,900 ppb.

q. The Maximum Contaminant Level (MCL) for TCE is 5 ppb.

r. Groundwater in the area of the Behr-Dayton facility is located approximately 20 feet below ground surface.

s. On October 16, 2006, Ohio EPA installed a total of seven soil gas probes along Daniel Street, Lamar Street and Milburn Avenue to evaluate potential risk posed by vapor intrusion from a VOC groundwater plume. The depth of the soil gas probes were approximately one to two feet above the depth of groundwater, which was determined to be approximately 20 feet below ground surface. Once the soil probes were installed, an air sample was collected and analyzed for VOCs using EPA Method TO-14 modified.

t. Ohio EPA soil gas analytical results detected TCE concentrations at the following levels:

Sample ID	SG-1	SG-2	SG-3	SG-4	SG-5	SG-6	SG-7
TCE (ppb)	120,000	70,000	160,000	140,000	13,000	16,000	12,000

u. At the request of the Ohio EPA, the U.S. EPA conducted a simultaneous vapor intrusion investigation. In October and November 2006, the U.S. EPA collected sub-slab air samples from eight residences located south of the Behr-Dayton facility along Milburn Avenue, Daniel Street and Leo Street. TCE concentrations were detected at the following levels:

Sample ID	EPA-01-55	EPA-01-552	EPA-02-55	EPA-03-55	EPA-01-55*	EPA-05-55	EPA-06-55	EPA-07-55
TCE (ppb)	14,000	6,980	18,000	16,000	260	62,000	3,700	62,000

v. The results of the sub-slab testing indicates that eight samples exceed the ATSDR residential TCE sub-slab screening level of 4 parts per billion by volume (ppbv) and four samples exceed the ATSDR residential TCE sub-slab immediate action level of 1,000 ppbv.

w. Based on ATSDR and Ohio Department of Health ("ODH") recommendations, the U.S. EPA followed sub-slab air sampling with indoor air sampling at eight locations in November 2006. TCE concentrations were detected at the following levels:

Sample ID	EPA-01-1A	EPA-02-1A	EPA-03-1A	EPA-04-1A	EPA-05-1A	EPA-06-1A	EPA-07-1A	EPA-08-1A
TCE (ppb)	1.2	180	130	13	260	7.5	0.4	49

The results of the indoor air sampling indicate that eight samples exceed the ATSDR residential TCE indoor air screening level of 0.4 ppbv and three samples exceed the ATSDR residential TCE indoor air immediate action level of 100 ppbv.

x. In a letter dated November 6, 2006, the Ohio EPA formally requested U.S. EPA assistance in conducting a time-critical removal action at the BVP Site. Ohio EPA made the following reference as the basis for its referral letter:

> "TCE concentrations in soil gas were as high as 160,000 ppbv. U.S. EPA sub-slab samples collected from October 11 to October 23 contained TCE at concentrations up to 62,000 ppbv. TCE concentrations in ground water samples collected by DaimlerChrysler in March 2006 were as high as 3,900 ppb beneath the residential area."

y. On November 7, 2006, U.S. EPA issued a general notice of potential liability under CERCLA to Behr-Dayton Thermal Systems LLC and DCC, revealing concerns about conditions at the Site. The general notice sought a commitment to perform the removal and reimburse U.S. EPA its costs incurred in connection with the Site.

z. Respondent DCC responded by letter dated November 20, 2006, indicating its commitment to address conditions at the Behr VOC Plume Site consistent with applicable law and regulation, and that it is willing to enter into an appropriate AOC that will delineate the scope of its responsibilities with respect to performing response actions at the Site and for reimbursement of necessary response costs incurred consistent with the National Contingency Plan.

V. CONCLUSIONS OF LAW AND DETERMINATIONS

10. Based on the Findings of Fact set forth above, and the Administrative Record supporting this removal action, U.S. EPA has determined that:

a. The Behr VOC Plume Site is a Afacility@ as defined by Section 101(9) of CERCLA, 42 U.S.C. ' 9601(9).

b. The contamination found at the Site, as identified in the Findings of Fact above, includes Ahazardous substances@ as defined by Section 101(14) of CERCLA, 42 U.S.C. ' 9601(14).

c. Respondent is a Aperson@ as defined by Section 101(21) of CERCLA, 42 U.S.C. ' 9601(21).

d. Respondent is a responsible party under Section 107(a) of CERCLA, 42 U.S.C. ' 9607(a), and is jointly and severally liable for performance of response action and for response

costs incurred and to be incurred at the Site.

i. Respondent Daimler-Chrysler is the Aowner@ and/or Aoperator@ of the facility at the time of disposal of hazardous substances at the facility, as defined by Section 101(20) of CERCLA, 42 U.S.C. ' 9601(20), and within the meaning of Section 107(a)(2) of CERCLA, 42 U.S.C. ' 9607(a)(2); and/or persons who arranged for disposal or treatment, or arranged with a transporter for transport for disposal or treatment of hazardous substances at the facility, within the meaning of Section 107(a)(3) of CERCLA, 42 U.S.C. ' 9607(a)(3); and/or persons who accept or accepted hazardous substances for transport to the facility, within the meaning of Section 107(a)(4) of CERCLA, 42 U.S.C. ' 9607(a)(4).

ii. The conditions described in the Findings of Fact above constitute an actual or threatened Arelease@ of a hazardous substance from the facility into the Aenvironment@ as defined by Sections 101(22) and 101(8) of CERCLA, 42 U.S.C.' ' 9601(22) and 9601(8).

e. The conditions present at the Site constitute a threat to public health, welfare, or the environment based upon the factors set forth in Section 300.415(b)(2) of the National Oil and Hazardous Substances Pollution Contingency Plan, as amended ("NCP"), 40 CFR '300.415(b)(2). These factors include, but are not limited to, the following:

i. Actual or potential exposure to nearby human populations, animals, or the food chain from hazardous substances, pollutants or contaminants. This factor is present at the Site due to the existence of TCE in the groundwater beneath residences south of the Behr-Dayton facility, and the migration of TCE vapors into residential homes

Vapor intrusion occurs when vapors produced by a chemical spill or groundwater contamination plume migrate through soil into the foundations of structures and into the indoor air. When chemicals are spilled on the ground, they will seep into the soil and make their way into the groundwater. VOCs, including TCE, produce vapors that travel through soil. These vapors can enter a home through cracks in the foundation or into a basement with a dirt floor or concrete slab.

TCE is a hazardous substance within the meaning of Section 101 (14) of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) because it is listed at 40 CFR Section 302.4. Historical groundwater sampling, Ohio EPA soil gas sampling, and U.S. EPA sub-slab and indoor air sampling results indicate that TCE vapors have migrated into residential homes at levels that have been determined by ATSDR and ODH to require action to protect human health.

The Agency for Toxic Substances and Disease Registry ("ATSDR") reports that

inhalation exposure to TCE at very high concentrations may affect the central nervous system, with symptoms such as dizziness, headaches, confusion, euphoria, facial numbness, and weakness.

U.S. EPA has documented eight residences exceed the ATSDR TCE sub-slab screening level of 4 ppbv and four residences exceed the ATSDR TCE sub-slab immediate action level of 1,000 ppbv. Sub-slab levels were documented as high as 62,000 ppbv. In addition, U.S. EPA has documented eight residences exceed the ATSDR TCE indoor air screening level of 0.4 ppbv and three residences exceed the ATSDR TCE indoor air immediate action level of 100 ppbv.

ii. **The unavailability of other appropriate federal or state response mechanisms to respond to the release.** This factor supports the actions required by this Settlement Agreement at the Site because Ohio EPA requested U.S. EPA Region 5 assistance with conducting a time-critical removal action at the Site, and the State of Ohio and local agencies do not have the funds to undertake the removal action at this Site.

f. The removal action required by this Settlement Agreement is necessary to protect the public health, welfare, or the environment and, if carried out in compliance with the terms of this Settlement Agreement, will be considered consistent with the NCP, as provided in Section 300.700(c)(3)(ii) of the NCP.

VI. SETTLEMENT AGREEMENT AND ORDER

11. Based upon the foregoing Findings of Fact, Conclusions of Law, Determinations, and the Administrative Record for this Site, it is hereby Ordered and Agreed that Respondent shall comply with all provisions of this Settlement Agreement, including, but not limited to, all attachments to this Settlement Agreement and all documents incorporated by reference into this Settlement Agreement.

VII. DESIGNATION OF CONTRACTOR, PROJECT COORDINATOR, AND ON-SCENE COORDINATOR

12. Respondent may retain one or more contractors to perform the Work and shall notify U.S. EPA of the name(s) and qualifications of such contractor(s) within 5 business days of the Effective Date. Respondent shall also notify U.S. EPA of the name(s) and qualification(s) of any other contractor(s) or subcontractor(s) retained to perform the Work at least 5 business days prior to commencement of such Work. U.S. EPA retains the right to disapprove of any or all of the contractors and/or subcontractors retained by Respondent. If U.S. EPA disapproves of a selected contractor, Respondent shall retain a different contractor and shall notify U.S. EPA of that contractor=s name and qualifications within 3 business days of U.S. EPA=s disapproval.

13. Respondent has designated a Project Coordinator who shall be responsible for administration of all actions by Respondent required by this Settlement Agreement and shall

submit to U.S. EPA the designated Project Coordinator=s qualifications. The designated Project Coordinator's name, address and telephone number are set forth below. To the greatest extent possible, the Project Coordinator shall be present on Site or readily available during Site work. Receipt by Respondent's Project Coordinator of any notice or communication from U.S. EPA relating to this Settlement Agreement shall constitute receipt by Respondent.

Gregory M. Rose, Senior Manager
Environmental Risk Management
Daimler Chrysler Corporation
800 Chrysler Drive
Auburn Hills, MI 48/326-2757
(248) 576-7362
Gmr4@Daimler Chrysler.com

14. U.S. EPA has designated Steve Renninger of the Emergency Response Branch, Region 5, as its On-Scene Coordinator (AOSC@). Except as otherwise provided in this Settlement Agreement, Respondent shall direct all submissions required by this Settlement Agreement to the OSC at the following address:

Steve Renninger, On-Scene Coordinator
U.S. EPA Region V
Emergency Response Branch
26 West Martin Luther King Drive (G41)
Cincinnati, OH 45268

Respondent is encouraged to make its submissions to U.S. EPA on recycled paper (which includes significant post consumer waste paper content where possible) and using two-sided copies.

15. U.S. EPA and Respondent shall have the right, subject to Paragraphs 13 and 14, to change their respective designated OSC or Project Coordinator. U.S. EPA shall notify the Respondent, and Respondent shall notify U.S. EPA, as early as possible before such a change is made, but in no case less than 24 hours before such a change. The initial notification may be made orally but it shall be promptly followed by a written notice.

VIII. WORK TO BE PERFORMED

16. Respondent shall perform, at a minimum, the following removal activities:

a. Develop and implement a Site Health and Safety Plan, including an Emergency Contingency Plan.

b. Conduct subsurface gas extent of contamination sampling at the Site utilizing groundwater, soil gas, sub-slab, and/or indoor air sampling techniques.

c. If the applicable Indoor Air Screening Level for TCE is exceeded, design and install interior TCE vapor abatement systems in structures impacted by TCE subsurface migration to meet the applicable indoor air screening level. Abatement systems may include installation of a sub-slab vapor removal system or crawl space vapor removal system, sealing cracks in walls and floors of the basement, and/or sealing or fixing drains that could be a pathway. The applicable screening levels, as set forth in paragraph 9.k, are: 1) for residential properties, the ATSDR residential indoor air screening level; 2) for commercial properties, the ATSDR commercial indoor air screening level; 3) for industrial properties, the OSHA employee exposure limits. If a property has mixed use, the more stringent standard applies.

d. Develop and implement a vapor abatement system performance sample plan to confirm that applicable indoor air screening levels are achieved for TCE following installation of the TCE vapor abatement systems. Work will not be completed at any structure until quarterly monitoring (4 continuous quarters) for sub-slab and indoor air is documented less than the applicable screening levels following termination of the installed TCE vapor abatement system operation. The OSC, in his discretion, will determine when the operation of any TCE vapor abatement system can be terminated.

17. Work Plan and Implementation.

a. Within 3 business days after the Effective Date, Respondent shall submit to U.S. EPA for approval a draft Phase I Work Plan for performing the removal actions described in Paragraph 16.a., c., and d. above for those locations already found to have exceeded the ATSDR Indoor Air Screening Level for TCE. The draft Work Plan shall provide a description of, and an expeditious schedule for, the actions required by this Settlement Agreement.

b. Within 45 calendar days after the Effective Date, Respondent shall submit to U.S. EPA for approval a draft Phase II Work Plan for performing the removal action generally described in Paragraph 16 above. The draft Work Plan shall provide a description of, and an expeditious schedule for, the actions required by this Settlement Agreement.

c. U.S. EPA may approve, disapprove, require revisions to, or modify the draft Work Plan in whole or in part. If U.S. EPA requires revisions, Respondent shall submit a revised draft Work Plan within 5 business days of receipt of U.S. EPA=s notification of the required revisions. Respondent shall implement the Work Plan as approved in writing by U.S. EPA in accordance with the schedule approved by U.S. EPA. Once approved, or approved with modifications, the Work Plan, the schedule, and any subsequent modifications shall be incorporated into and become fully enforceable under this Settlement Agreement.

d. Respondent shall not commence any Work except in conformance with the terms of this Settlement Agreement. Respondent shall not commence implementation of the Work Plan developed hereunder until receiving written U.S. EPA approval pursuant to Paragraph 17(b).

18. Health and Safety Plan. Within 3 business days after the Effective Date, Respondent

shall submit for U.S. EPA review and comment a plan that ensures the protection of the public health and safety during performance of on-Site work under this Settlement Agreement. This plan shall be prepared consistent with U.S. EPA=s Standard Operating Safety Guide (PUB 9285.1-03, PB 92-963414, June 1992). In addition, the plan shall comply with all currently applicable Occupational Safety and Health Administration (AOSHA@) regulations found at 29 C.F.R. Part 1910. The plan shall also include contingency planning. Respondent shall incorporate all changes to the plan recommended by U.S. EPA and shall implement the plan during the pendency of the removal action.

19. Quality Assurance and Sampling.

a. All sampling and analyses performed pursuant to this Settlement Agreement shall conform to U.S. EPA direction, approval, and guidance regarding sampling, quality assurance/quality control (AQA/QC@), data validation, and chain of custody procedures. Respondent shall ensure that the laboratory used to perform the analyses participates in a QA/QC program that complies with the appropriate U.S. EPA guidance. Respondent shall follow, as appropriate, AQuality Assurance/Quality Control Guidance for Removal Activities: Sampling QA/QC Plan and Data Validation Procedures@ (OSWER Directive No. 9360.4-01, April 1, 1990), as guidance for QA/QC and sampling. Respondent shall only use laboratories that have a documented Quality System that complies with ANSI/ASQC E-4 1994, ASpecifications and Guidelines for Quality Systems for Environmental Data Collection and Environmental Technology Programs@ (American National Standard, January 5, 1995), and AEPA Requirements for Quality Management Plans (QA/R-2) (EPA/240/B-01/002, March 2001),@ or equivalent documentation as determined by U.S. EPA. U.S. EPA may consider laboratories accredited under the National Environmental Laboratory Accreditation Program (ANELAP@) as meeting the Quality System requirements.

b. Upon request by U.S. EPA, Respondent shall have such a laboratory analyze samples submitted by U.S. EPA for QA monitoring. Respondent shall provide to U.S. EPA the QA/QC procedures followed by all sampling teams and laboratories performing data collection and/or analysis.

c. Upon request by U.S. EPA, Respondent shall allow U.S. EPA or its authorized representatives to take split and/or duplicate samples. Respondent shall notify U.S. EPA not less than 3 business days in advance of any sample collection activity, unless shorter notice is agreed to by U.S. EPA. U.S. EPA shall have the right to take any additional samples that U.S. EPA deems necessary. Upon request, U.S. EPA shall allow Respondent to take split or duplicate samples of any samples it takes as part of its oversight of Respondent's implementation of the Work.

20. Post-Removal Site Control. In accordance with the Work Plan schedule, or as otherwise directed by U.S. EPA, Respondent shall submit a proposal for post-removal site control consistent with Section 300.415(*l*) of the NCP and OSWER Directive No. 9360.2-02. Upon U.S. EPA approval, Respondent shall implement such controls and shall provide U.S. EPA

with documentation of all post-removal site control arrangements.

21. Reporting.

a. Respondent shall submit a written progress report to U.S. EPA concerning actions undertaken pursuant to this Settlement Agreement every 30th day after the date of receipt of U.S. EPA=s approval of the Work Plan until termination of this Settlement Agreement, unless otherwise directed in writing by the OSC. These reports shall describe all significant developments during the preceding period, including the actions performed and any problems encountered, analytical data received during the reporting period, and the developments anticipated during the next reporting period, including a schedule of actions to be performed, anticipated problems, and planned resolutions of past or anticipated problems.

b. Respondent shall submit 3 copies of all plans, reports or other submissions required by this Settlement Agreement, or any approved work plan. Upon request by U.S. EPA, Respondent shall submit such documents in electronic form.

22. Final Report. Within 60 calendar days after completion of all Work required by Section VIII (Work To Be Performed) of this Settlement Agreement, Respondent shall submit to U.S. EPA's OSC for review a final report summarizing the actions taken to comply with this Settlement Agreement. The final report shall conform, at a minimum, with the requirements set forth in Section 300.165 of the NCP entitled AOSC Reports@ and with the guidance set forth in ASuperfund Removal Procedures: Removal Response Reporting B POLREPS and OSC Reports@ (OSWER Directive No. 9360.3-03, June 1, 1994). The final report shall include a good faith estimate of total costs or a statement of actual costs incurred in complying with the Settlement Agreement, a listing of quantities and types of materials removed off-Site or handled on-Site, a discussion of removal and disposal options considered for those materials, a listing of the ultimate destination(s) of those materials, a presentation of the analytical results of all sampling and analyses performed, and accompanying appendices containing all relevant documentation generated during the removal action (*e.g.*, manifests, invoices, bills, contracts, and permits). The final report shall also include the following certification signed by a person who supervised or directed the preparation of that report:

> AUnder penalty of law, I certify that to the best of my knowledge, after appropriate inquiries of all relevant persons involved in the preparation of the report, the information submitted is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.@

23. Off-Site Shipments.

a. For work at the Site authorized under this Settlement Agreement, Respondent shall, prior to any off-Site shipment of Waste Material from the Site to an out-of-state waste

management facility, provide written notification of such shipment of Waste Material to the appropriate state environmental official in the receiving facility=s state and to the On-Scene Coordinator. However, this notification requirement shall not apply to any off-Site shipments when the total volume of all such shipments will not exceed 10 cubic yards.

i. Respondent shall include in the written notification the following information: 1) the name and location of the facility to which the Waste Material is to be shipped; 2) the type and quantity of the Waste Material to be shipped; 3) the expected schedule for the shipment of the Waste Material; and 4) the method of transportation. Respondent shall notify the state in which the planned receiving facility is located of major changes in the shipment plan, such as a decision to ship the Waste Material to another facility within the same state, or to a facility in another state.

ii. The identity of the receiving facility and state will be determined by Respondent following the award of the contract for the removal action. Respondent shall provide the information required by Paragraph 23(a) and 23(b) as soon as practicable after the award of the contract and before the Waste Material is actually shipped.

b. Before shipping any hazardous substances, pollutants, or contaminants from work conducted at the Site authorized under this Settlement Agreement to an off-site location, Respondent shall obtain U.S. EPA=s certification that the proposed receiving facility is operating in compliance with the requirements of CERCLA Section 121(d)(3), 42 U.S.C. ' 9621(d)(3), and 40 C.F.R. ' 300.440. Respondent shall only send hazardous substances, pollutants, or contaminants from the Site to an off-site facility that complies with the requirements of the statutory provision and regulation cited in the preceding sentence for work at the Site authorized under this Settlement Agreement.

IX. SITE ACCESS

24. Where any action under this Settlement Agreement is to be performed in areas owned by or in possession of someone other than Respondent, Respondent shall use its best efforts to obtain all necessary access agreements 10 calendar days after the date the OSC determines that access to a particular property is necessary, or as otherwise specified in writing by the OSC. Respondent shall immediately notify U.S. EPA if after using their best efforts they are unable to obtain such agreements. For purposes of this Paragraph, Abest efforts@ includes the payment of reasonable sums of money in consideration of access. Respondent shall describe in writing its efforts to obtain access. U.S. EPA may then assist Respondent in gaining access, to the extent necessary to effectuate the response actions described herein, using such means as U.S. EPA deems appropriate. Respondent shall reimburse U.S. EPA for all costs and attorney=s fees incurred by the United States in obtaining such access, in accordance with the procedures in Section XV (Payment of Response Costs).

25. Notwithstanding any provision of this Settlement Agreement, U.S. EPA and the State retain all of their access authorities and rights, including enforcement authorities related thereto,

under CERCLA, RCRA, and any other applicable statutes or regulations.

X. ACCESS TO INFORMATION

26. Respondent shall provide to U.S. EPA, upon request, copies of all documents and information within their possession or control or that of their contractors or agents relating to the work under this Settlement Agreement at the Site or to the implementation of this Settlement Agreement, including, but not limited to, sampling, analysis, chain of custody records, manifests, trucking logs, receipts, reports, sample traffic routing, correspondence, or other documents or information related to the Work. Respondent shall also make available to U.S. EPA, for purposes of investigation, information gathering, or testimony, their employees, agents, or representatives with knowledge of relevant facts concerning the performance of the Work required by this Settlement Agreement.

27. Respondent may assert business confidentiality claims covering part or all of the documents or information submitted to U.S. EPA under this Settlement Agreement to the extent permitted by and in accordance with Section 104(e)(7) of CERCLA, 42 U.S.C. ' 9604(e)(7), and 40 C.F.R. ' 2.203(b). Documents or information determined to be confidential by U.S. EPA will be afforded the protection specified in 40 C.F.R. Part 2, Subpart B. If no claim of confidentiality accompanies documents or information when they are submitted to U.S. EPA, or if U.S. EPA has notified Respondent that the documents or information are not confidential under the standards of Section 104(e)(7) of CERCLA or 40 C.F.R. Part 2, Subpart B, the public may be given access to such documents or information without further notice to Respondent.

28. Respondent may assert that certain documents, records and other information are privileged under the attorney-client privilege, the attorney work-product privilege or any other privilege recognized by federal law. If the Respondent asserts such a privilege in lieu of providing documents, they shall provide U.S. EPA with the following: 1) the title of the document, record, or information; 2) the date of the document, record, or information; 3) the name and title of the author of the document, record, or information; 4) the name and title of each addressee and recipient; 5) a description of the contents of the document, record, or information; and 6) the privilege asserted by Respondent. However, no documents, reports or other information created or generated pursuant to the requirements of this Settlement Agreement shall be withheld on the grounds that they are privileged.

29. No claim of confidentiality shall be made with respect to any data created or generated pursuant to the requirements of this Settlement Agreement, including, but not limited to, all sampling, analytical, monitoring, hydrogeologic, scientific, chemical, or engineering data, or any other documents or information evidencing conditions at or around the Site.

XI. RECORD RETENTION

30. Until 6 years after Respondent's receipt of U.S. EPA=s notification pursuant to Section XXVI (Notice of Completion of Work), each Respondent shall preserve and retain all non-identical copies of records and documents created or generated pursuant to the requirements

of this Settlement Agreement (including records or documents in electronic form) now in its possession or control or which come into its possession or control that relate in any manner to the performance of the Work or the liability of any person under CERCLA with respect to the Site, regardless of any corporate retention policy to the contrary. Until 6 years after Respondent's receipt of U.S. EPA=s notification pursuant to Section XXVI (Notice of Completion of Work), Respondent shall also instruct its contractors and agents to preserve all documents, records, and information of whatever kind, nature or description relating to performance of the Work pursuant to this Settlement Agreement.

31. At the conclusion of this document retention period, Respondent shall notify U.S. EPA at least 60 days prior to the destruction of any such records or documents, and, upon request by U.S. EPA, Respondent shall deliver any such records or documents to U.S. EPA. Respondent may assert that certain documents, records and other information are privileged under the attorney-client privilege, attorney work product privilege, or any other privilege recognized by federal law. If Respondent asserts such a privilege, it shall provide U.S. EPA with the following: 1) the title of the document, record, or information; 2) the date of the document, record, or information; 3) the name and title of the author of the document, record, or information; 4) the name and title of each addressee and recipient; 5) a description of the subject of the document, record, or information; and 6) the privilege asserted by Respondent. However, no documents, reports or other information the creation or development of which is required by this Settlement Agreement shall be withheld on the grounds that they are privileged.

32. Respondent hereby certifies that to the best of its knowledge and belief, after thorough inquiry, it has not altered, mutilated, discarded, destroyed or otherwise disposed of any records, documents or other information (other than identical copies) relating to its potential liability regarding the Site since notification of potential liability by U.S. EPA or the State or the filing of suit against it regarding the Site and that it has fully complied and will fully comply with any and all U.S. EPA requests for information pursuant to Sections 104(e) and 122(e) of CERCLA, 42 U.S.C. ' ' 9604(e) and 9622(e), and Section 3007 of RCRA, 42 U.S.C. ' 6927.

XII. COMPLIANCE WITH OTHER LAWS

33. Respondent shall perform all actions required pursuant to this Settlement Agreement in accordance with all applicable local, state, and federal laws and regulations except as provided in Section 121(e) of CERCLA, 42 U.S.C. ' 6921(e), and 40 C.F.R. ' ' 300.400(e) and 300.415(j). In accordance with 40 C.F.R. ' 300.415(j), all on-Site actions required pursuant to this Settlement Agreement shall, to the extent practicable, as determined by U.S. EPA, considering the exigencies of the situation, attain applicable or relevant and appropriate requirements (AARARs@) under federal environmental or state environmental or facility siting laws. Respondent shall identify ARARs in the Work Plan subject to U.S. EPA approval.

XIII. EMERGENCY RESPONSE AND NOTIFICATION OF RELEASES

34. In the event of any action or occurrence during performance of the Work which causes or threatens a release of Waste Material from the Site that constitutes an emergency

situation or may present an immediate threat to public health or welfare or the environment, Respondent shall immediately take all appropriate action. Respondent shall take these actions in accordance with all applicable provisions of this Settlement Agreement, including, but not limited to, the Health and Safety Plan, in order to prevent, abate or minimize such release or endangerment caused or threatened by the release. Respondent shall also immediately notify the OSC or, in the event of his/her unavailability, the Regional Duty Officer, Emergency Response Branch, Region 5 at (312) 353-2318, of the incident or Site conditions. In the event that Respondent fails to take appropriate response action as required by this Paragraph, and U.S. EPA takes such action instead, Respondent shall reimburse U.S. EPA all costs of the response action consistent with the NCP pursuant to Section XV (Payment of Response Costs).

35. In addition, in the event of any release of a hazardous substance from the Site, Respondent shall immediately notify the OSC at (312) 353-2318 and the National Response Center at (800) 424-8802. Respondent shall submit a written report to U.S. EPA within 7 business days after each release, setting forth the events that occurred and the measures taken or to be taken to mitigate any release or endangerment caused or threatened by the release and to prevent the reoccurrence of such a release. This reporting requirement is in addition to, and not in lieu of, reporting under Section 103(c) of CERCLA, 42 U.S.C. ' 9603(c), and Section 304 of the Emergency Planning and Community Right-To-Know Act of 1986, 42 U.S.C. ' 11004, *et seq.*

XIV. AUTHORITY OF ON-SCENE COORDINATOR

36. The OSC shall be responsible for overseeing Respondent's implementation of this Settlement Agreement. The OSC shall have the authority vested in an OSC by the NCP, including the authority to halt, conduct, or direct any Work required by this Settlement Agreement, or to direct any other removal action undertaken at the Site. Absence of the OSC from the Site shall not be cause for stoppage of work unless specifically directed by the OSC.

37. Section 107(d)(1) of CERCLA, 42 U.S.C. § 9607(d)(1), provides: "Except as provided in paragraph (2), no person shall be liable under this subchapter for costs or damages as a result of actions taken or omitted in the course of rendering care, assistance, or advice in accordance with the National Contingency Plan or at the direction of an onscene coordinator appointed under such plan, with respect to an incident creating a danger to public health or welfare or the environment as a result of any releases of a hazardous substance or the threat thereof. This paragraph shall not preclude liability for costs or damages as the result of negligence on the part of such person."

XV. PAYMENT OF RESPONSE COSTS

38. Payments for Response Costs.

a. Respondent shall pay U.S. EPA all Response Costs consistent with the NCP. On a periodic basis, U.S. EPA will send Respondent a bill requiring payment that consists of an Itemized Cost Summary. Respondent shall make all payments within 60 calendar days of receipt

of each bill requiring payment, except as otherwise provided in Paragraph 40 of this Settlement Agreement according to the following procedures:

i. If the payment amount demanded in the bill is for $10,000 or greater, payment shall be made to U.S. EPA by EFT in accordance with current Electronic Funds Transfer ("EFT") procedures to be provided to Respondent by U.S. EPA Region 5. Payment shall be accompanied by a statement identifying the name and address of the party(ies) making payment, the Site name, U.S. EPA Region 5, the Site/Spill ID Number B5FH, and, if any, the U.S. EPA docket number for this action. Respondent shall: 1) complete Respondent's required bank form; 2) include Mellon Bank, ABA #021030004 on the bank form; 3) include the U.S. EPA Account #68010727on the form; 4) include AD 68010727 Environmental Protection Agency@ in Field Tag 4200 of the Fedwire message; and 5) include the statement identifying the name and address of the party(ies) making payment, the Site name, the U.S. EPA Region and Site/Spill ID Number.

ii. If the amount demanded in the bill is $10,000 or less, the Settling Respondent may, in lieu of the procedures in subparagraph 38(a)(i), make all payments required by this Paragraph by a certified or cashier=s check or checks made payable to AEPA Hazardous Substance Superfund@, referencing the name and address of the party making the payment, the Site name, U.S. EPA Region 5, the Site/Spill ID Number B5FH, and, if any, the U.S. EPA docket number for this action, and shall be sent to:

U.S. Environmental Protection Agency
Region 5
P.O. Box 371531
Pittsburgh, Pennsylvania 15251-7531

b. At the time of payment, Respondent shall send notice that payment has been made to the Director, Superfund Division, U.S. EPA Region 5, 77 West Jackson Blvd., Chicago, Illinois, 60604-3590 and to Maria Gonzalez, Associate Regional Counsel, 77 West Jackson Boulevard, C-14J, Chicago, Illinois, 60604-3590.

c. The total amount to be paid by Respondent pursuant to Paragraph 38(a) shall be deposited in the Behr VOC Plume Site Special Account within the U.S. EPA Hazardous Substance Superfund to be retained and used to conduct or finance response actions at or in connection with the Site, or to be transferred by U.S. EPA to the U.S. EPA Hazardous Substance Superfund.

39. In the event that the payment for Response Costs is not made within 60 days of Respondent's receipt of a bill, Respondent shall pay Interest on the unpaid balance. The Interest on Response Costs shall begin to accrue on the date of the bill and shall continue to accrue until the date of payment. Payments of Interest made under this Paragraph shall be in addition to such other remedies or sanctions available to the United States by virtue of Respondent's failure to make timely payments under this Section, including but not limited to, payment of stipulated

penalties pursuant to Section XVIII (Stipulated Penalties).

40. Respondent may dispute all or part of a bill for Response Costs submitted under this Settlement Agreement, only if Respondent alleges that U.S. EPA has made an accounting error, or if Respondent alleges that a cost item is inconsistent with the NCP. If any dispute over costs is resolved before payment is due, the amount due will be adjusted as necessary. If the dispute is not resolved before payment is due, Respondent shall pay the full amount of the uncontested costs to U.S. EPA as specified in Paragraph 38 on or before the due date. Within the same time period, Respondent shall pay the full amount of the contested costs into an interest-bearing escrow account. Respondent shall simultaneously transmit a copy of both checks to the persons listed in Paragraph 38(b) above. Respondent shall ensure that the prevailing party or parties in the dispute shall receive the amount upon which they prevailed from the escrow funds plus interest within 20 calendar days after the dispute is resolved.

XVI. DISPUTE RESOLUTION

41. Unless otherwise expressly provided for in this Settlement Agreement, the dispute resolution procedures of this Section shall be the exclusive mechanism for resolving disputes arising under this Settlement Agreement. The Parties shall attempt to resolve any disagreements concerning this Settlement Agreement expeditiously and informally.

42. If Respondent objects to any U.S. EPA action taken pursuant to this Settlement Agreement, including billings for Response Costs, it shall notify U.S. EPA in writing of its objection(s) within 10 calendar days of such action, unless the objection(s) has/have been resolved informally. This written notice shall include a statement of the issues in dispute, the relevant facts upon which the dispute is based, all factual data, analysis or opinion supporting Respondent's position, and all supporting documentation on which such party relies. U.S. EPA shall provide its Statement of Position, including supporting documentation, no later than 10 calendar days after receipt of the written notice of dispute. In the event that these 10-day time periods for exchange of written documents may cause a delay in the work, they shall be shortened upon, and in accordance with, notice by U.S. EPA. The time periods for exchange of written documents relating to disputes over billings for response costs may be extended at the sole discretion of U.S. EPA. An administrative record of any dispute under this Section shall be maintained by U.S. EPA. The record shall include the written notification of such dispute, and the Statement of Position served pursuant to the preceding Paragraph. Upon review of the administrative record, the Director of the Superfund Division, U.S. EPA Region 5, shall resolve the dispute consistent with the NCP and the terms of this Settlement Agreement.

43. Respondent's obligations under this Settlement Agreement shall not be tolled by submission of any objection for dispute resolution under this Section. Following resolution of the dispute, as provided by this Section, Respondent shall fulfill the requirement that was the subject of the dispute in accordance with the agreement reached or with U.S. EPA=s decision, whichever occurs.

XVII. FORCE MAJEURE

44. Respondent agrees to perform all requirements of this Settlement Agreement within the time limits established under this Settlement Agreement, unless the performance is delayed by a *force majeure*. For purposes of this Settlement Agreement, a *force majeure* is defined as any event arising from causes beyond the control of Respondent, or of any entity controlled by Respondent, including but not limited to its contractors and subcontractors, which delays or prevents performance of any obligation under this Settlement Agreement despite Respondent's best efforts to fulfill the obligation. *Force majeure* does not include financial inability to complete the Work or increased cost of performance.

45. If any event occurs or has occurred that may delay the performance of any obligation under this Settlement Agreement, whether or not caused by a *force majeure* event, Respondent shall notify U.S. EPA orally within 24 hours of when Respondent first knew that the event might cause a delay. Within 7 calendar days thereafter, Respondent shall provide to U.S. EPA in writing an explanation and description of the reasons for the delay; the anticipated duration of the delay; all actions taken or to be taken to prevent or minimize the delay; a schedule for implementation of any measures to be taken to prevent or mitigate the delay or the effect of the delay; Respondent's rationale for attributing such delay to a *force majeure* event if it intends to assert such a claim; and a statement as to whether, in the opinion of Respondent, such event may cause or contribute to an endangerment to public health, welfare or the environment. Failure to comply with the above requirements shall be grounds for U.S. EPA to deny Respondent an extension of time for performance. Respondent shall have the burden of demonstrating by a preponderance of the evidence that the event is a force majeure, that the delay is warranted under the circumstances, and that best efforts were exercised to avoid and mitigate the effects of the delay.

46. If U.S. EPA agrees that the delay or anticipated delay is attributable to a *force majeure* event, the time for performance of the obligations under this Settlement Agreement that are affected by the *force majeure* event will be extended by U.S. EPA for such time as is necessary to complete those obligations. An extension of the time for performance of the obligations affected by the *force majeure* event shall not, of itself, extend the time for performance of any other obligation. If U.S. EPA does not agree that the delay or anticipated delay has been or will be caused by a *force majeure* event, U.S. EPA will notify Respondent in writing of its decision. If U.S. EPA agrees that the delay is attributable to a *force majeure* event, U.S. EPA will notify Respondent in writing of the length of the extension, if any, for performance of the obligations affected by the *force majeure* event.

XVIII. STIPULATED PENALTIES

47. Respondent shall be liable to U.S. EPA for stipulated penalties in the amounts set forth in Paragraphs 48 and 49 for failure to comply with the requirements of this Settlement Agreement specified below, unless excused under Section XVII (Force Majeure). ACompliance@ by Respondent shall include completion of the activities under this Settlement Agreement or any work plan or other plan approved under this Settlement Agreement identified below in accordance with all applicable requirements of this Settlement Agreement within the

specified time schedules established by and approved under this Settlement Agreement.

48. Stipulated Penalty Amounts - Work.

a. The following stipulated penalties shall accrue per violation per day for any noncompliance identified in Paragraph 48(b) not excused under Section XVII (Force Majeure):

Penalty Per Violation Per Day	Period of Noncompliance
$2,000	1st through 14th day
$5,000	15th through 30th day
$10,000	31st day and beyond

b. Compliance Milestones
Designation of Respondent=s Contractor
Designation of Respondent=s Project Coordinator
Submission of Health and Safety Plan
Submission of Emergency Contingency Plan
Submission of QAPP
Submission of Work Plan(s)
Initiation of Work
Completion of Post-Removal Site Controls

49. Stipulated Penalty Amounts - Reports. The following stipulated penalties shall accrue per violation per day for failure to submit timely or adequate reports or other written documents pursuant to Paragraphs 17-22 unless excused under Section XVII (Force Majeure):

Penalty Per Violation Per Day	Period of Noncompliance
$500	1st through 14th day
$1,000	15th through 30th day
$5,000	31st day and beyond

50. All penalties shall begin to accrue on the day after the complete performance is due or the day a violation occurs, and shall continue to accrue through the final day of the correction of the noncompliance or completion of the activity. However, stipulated penalties shall not accrue: 1) with respect to a deficient submission under Section VIII (Work to be Performed), during the period, if any, beginning on the 31st day after U.S. EPA=s receipt of such submission until the date that U.S. EPA notifies Respondent of any deficiency; and 2) with respect to a decision by the Director of the Superfund Division, Region 5, under Paragraph 42 of Section XVI (Dispute Resolution), during the period, if any, beginning on the 21st day after U.S. EPA submits its written statement of position until the date that the Director of the Superfund Division issues a final decision regarding such dispute. Nothing herein shall prevent the simultaneous accrual of separate penalties for separate violations of this Settlement Agreement.

51. Following U.S. EPA=s determination that Respondent has failed to comply with a requirement of this Settlement Agreement, U.S. EPA may give Respondent written notification of the failure and describe the noncompliance. U.S. EPA may send Respondent a written demand for payment of the penalties. However, penalties shall accrue as provided in the preceding Paragraph regardless of whether U.S. EPA has notified Respondent of a violation.

52. All penalties accruing under this Section shall be due and payable to U.S. EPA within 30 days of Respondent's receipt from U.S. EPA of a written demand for payment of the penalties, unless Respondent invokes the dispute resolution procedures under Section XVI (Dispute Resolution). All payments to U.S. EPA under this Section shall be paid by certified or cashier=s check(s) made payable to AU.S. EPA Hazardous Substances Superfund,@ shall be mailed to U.S. Environmental Protection Agency, Region 5, Program Accounting & Analysis Section, P.O. Box 371531, Pittsburgh, Pennsylvania 15251-7531, shall indicate that the payment is for stipulated penalties, and shall reference the U.S. EPA Site/Spill ID Number B5FH, the U.S. EPA Docket Number, and the name and address of the party making payment. Copies of check(s) paid pursuant to this Section, and any accompanying transmittal letter(s), shall be sent to U.S. EPA as provided in Paragraph 38(b).

53. The payment of penalties shall not alter in any way Respondent's obligation to complete performance of the Work required under this Settlement Agreement.

54. Penalties shall continue to accrue during any dispute resolution period, but need not be paid until 20 days after the dispute is resolved by agreement or by receipt of U.S. EPA=s decision.

55. If Respondent fails to pay stipulated penalties when due, U.S. EPA may institute proceedings to collect the penalties, as well as Interest. Respondent shall pay Interest on the unpaid balance, which shall begin to accrue on the date of written demand made pursuant to Paragraph 51. Nothing in this Settlement Agreement shall be construed as prohibiting, altering, or in any way limiting the ability of U.S. EPA to seek any other remedies or sanctions available by virtue of Respondent's violation of this Settlement Agreement or of the statutes and regulations upon which it is based, including, but not limited to, penalties pursuant to Sections 106(b) and 122(*l*) of CERCLA, 42 U.S.C. ' ' 9606(b) and 9622(*l*), and punitive damages pursuant to Section 107(c)(3) of CERCLA, 42 U.S.C. ' 9607(c)(3). Provided, however, that U.S. EPA shall not seek civil penalties pursuant to Section 106(b) or 122(*l*) of CERCLA or punitive damages pursuant to Section 107(c)(3) of CERCLA for any violation for which a stipulated penalty is provided herein, except in the case of a willful violation of this Settlement Agreement. Should Respondent violate this Settlement Agreement or any portion hereof, U.S. EPA may carry out the required actions unilaterally, pursuant to Section 104 of CERCLA, 42 U.S.C. '9604, and/or may seek judicial enforcement of this Settlement Agreement pursuant to Section 106 of CERCLA, 42 U.S.C. '9606. Notwithstanding any other provision of this Section, U.S. EPA may, in its unreviewable discretion, waive in writing any portion of stipulated penalties that have accrued pursuant to this Settlement Agreement.

XIX. COVENANT NOT TO SUE BY U.S. EPA

56. In consideration of the actions that will be performed and the payments that will be made by Respondent under the terms of this Settlement Agreement, and except as otherwise specifically provided in this Settlement Agreement, U.S. EPA covenants not to sue or to take administrative action against Respondent pursuant to Sections 106 and 107(a) of CERCLA, 42 U.S.C. ' ' 9606 and 9607(a), for the Work and Response Costs. This covenant not to sue shall take effect upon the Effective Date and is conditioned upon the complete and satisfactory performance by Respondent of all obligations under this Settlement Agreement, including, but not limited to, payment of Response Costs pursuant to Section XV (Payment of Response Costs). This covenant not to sue extends only to Respondent and does not extend to any other person.

XX. RESERVATIONS OF RIGHTS BY U.S. EPA

57. Except as specifically provided in this Settlement Agreement, nothing herein shall limit the power and authority of U.S. EPA or the United States to take, direct, or order all actions necessary to protect public health, welfare, or the environment or to prevent, abate, or minimize an actual or threatened release of hazardous substances, pollutants or contaminants, or hazardous or solid waste on, at, or from the Site. Further, nothing herein shall prevent U.S. EPA from seeking legal or equitable relief to enforce the terms of this Settlement Agreement. U.S. EPA also reserves the right to take any other legal or equitable action as it deems appropriate and necessary, or to require the Respondent in the future to perform additional activities pursuant to CERCLA or any other applicable law.

58. The covenant not to sue set forth in Section XIX (Covenant Not to Sue by U.S. EPA) above does not pertain to any matters other than those expressly identified therein. U.S. EPA reserves, and this Settlement Agreement is without prejudice to, all rights against Respondent with respect to all other matters, including, but not limited to:

a. claims based on a failure by Respondent to meet a requirement of this Settlement Agreement;

b. liability for costs not included within the definition of Response Costs;

c. liability for performance of response action other than the Work;

d. criminal liability;

e. liability for damages for injury to, destruction of, or loss of natural resources, and for the costs of any natural resource damage assessments;

f. liability arising from the past, present, or future disposal, release or threat of release of Waste Materials outside of the Site; and

g. liability for costs incurred or to be incurred by the Agency for Toxic Substances and Disease Registry related to the Site.

XXI. COVENANT NOT TO SUE BY RESPONDENT

59. Respondent covenants not to sue and agrees not to assert any claims or causes of action against the United States, or its contractors or employees, with respect to the Work, Response Costs, or this Settlement Agreement, including, but not limited to:

a. any direct or indirect claim for reimbursement from the Hazardous Substance Superfund established by 26 U.S.C. ' 9507, based on Sections 106(b)(2), 107, 111, 112, or 113 of CERCLA, 42 U.S.C. ' ' 9606(b)(2), 9607, 9611, 9612, or 9613, or any other provision of law;

b. any claim arising out of response actions at or in connection with the Site, including any claim under the United States Constitution, the Ohio Constitution, the Tucker Act, 28 U.S.C. ' 1491, the Equal Access to Justice Act, 28 U.S.C. ' 2412, as amended, or at common law; or

c. any claim against the United States pursuant to Sections 107 and 113 of CERCLA, 42 U.S.C. ' ' 9607 and 9613, relating to the Site.

These covenants not to sue shall not apply in the event the United States brings a cause of action or issues an order pursuant to the reservations set forth in Paragraphs 58 (b), (c), and (e) - (g), but only to the extent that Respondent's claims arise from the same response action, response costs, or damages that the United States is seeking pursuant to the applicable reservation.

60. Nothing in this Agreement shall be deemed to constitute approval or preauthorization of a claim within the meaning of Section 111 of CERCLA, 42 U.S.C. ' 9611, or 40 C.F.R. ' 300.700(d).

XXII. OTHER CLAIMS

61. By issuance of this Settlement Agreement, the United States and U.S. EPA assume no liability for injuries or damages to persons or property resulting from any acts or omissions of Respondent. The United States or U.S. EPA shall not be deemed a party to any contract entered into by Respondent or its directors, officers, employees, agents, successors, representatives, assigns, contractors, or consultants in carrying out actions pursuant to this Settlement Agreement.

62. Except as expressly provided in Section XXI (Covenant Not to Sue by Respondent), and Section XX (Covenant Not to Sue by U.S. EPA), nothing in this Settlement Agreement constitutes a satisfaction of or release from any claim or cause of action against Respondent or any person not a party to this Settlement Agreement, for any liability such person may have under CERCLA, other statutes, or common law, including but not limited to any claims of the

United States for costs, damages and interest under Sections 106 and 107 of CERCLA, 42 U.S.C. ' ' 9606 and 9607.

63. No action or decision by U.S. EPA pursuant to this Settlement Agreement shall give rise to any right to judicial review, except as set forth in Section 113(h) of CERCLA, 42 U.S.C. ' 9613(h).

XXIII. CONTRIBUTION

64. a. The Parties agree that this Settlement Agreement constitutes an administrative settlement for purposes of Section 113(f)(2) of CERCLA, 42 U.S.C. ' 9613(f)(2), and that Respondent is entitled, as of the Effective Date, to protection from contribution actions or claims as provided by Sections 113(f)(2) and 122(h)(4) of CERCLA, 42 U.S.C. ' ' 9613(f)(2) and 9622(h)(4), for Amatters addressed@ in this Settlement Agreement. The Amatters addressed@ in this Settlement Agreement are the Work and Response Costs.

b. The Parties agree that this Settlement Agreement constitutes an administrative settlement for purposes of Section 113(f)(3)(B) of CERCLA, 42. U.S.C. ' 9613(f)(3)(B), pursuant to which the Respondent has, as of the Effective Date, resolved its liability to the United States for the Work and Response Costs.

c. Except as provided in Section XXI(Covenant Not To Sue By Respondent), nothing in this Settlement Agreement precludes the United States or Respondent from asserting any claims, causes of action, or demands for indemnification, contribution, or cost recovery against any persons not parties to this Settlement Agreement. Nothing herein diminishes the right of the United States, pursuant to Section 113(f)(2)and (3), 42 U.S.C. ' 9613(f)(2) and (3), to pursue any such persons to obtain additional response costs or response action, and to enter into settlements that give rise to contribution protection pursuant to Section 113(f)(2) of CERCLA, 42 U.S.C. ' 9613(f)(2).

XXIV. INDEMNIFICATION

65. Respondent shall indemnify, save and hold harmless the United States, its officials, agents, contractors, subcontractors, employees and representatives from any and all claims or causes of action arising from, or on account of, negligent or other wrongful acts or omissions of Respondent, its officers, directors, employees, agents, contractors, or subcontractors, in carrying out actions pursuant to this Settlement Agreement. In addition, Respondent agrees to pay the United States all costs incurred by the United States not inconsistent with the National Contingency Plan, including but not limited to attorneys fees and other expenses of litigation and settlement, arising from or on account of claims made against the United States based on negligent or other wrongful acts or omissions of Respondent, its officers, directors, employees,

agents, contractors, subcontractors and any persons acting on their behalf or under their control, in carrying out activities pursuant to this Settlement Agreement. The United States shall not be held out as a party to any contract entered into by or on behalf of Respondent in carrying out activities pursuant to this Settlement Agreement. Neither Respondent nor any such contractor shall be considered an agent of the United States. The Federal Tort Claims Act (28 U.S.C. ' ' 2671, 2680) provides coverage for injury or loss of property, or injury or death caused by the negligent or wrongful act or omission of an employee of U.S. EPA while acting within the scope of his or her employment, under circumstances where U.S. EPA, if a private person, would be liable to the claimant in accordance with the law of the place where the act or omission occurred.

66. The United States shall give Respondent notice of any claim for which the United States plans to seek indemnification pursuant to this Section and shall consult with Respondent prior to settling such claim.

67. Respondent waives all claims against the United States for damages or reimbursement or for set-off of any payments made or to be made to the United States, arising from or on account of any contract, agreement, or arrangement between Respondent and any person for performance of Work on or relating to the Site, including, but not limited to, claims on account of construction delays. In addition, Respondent shall indemnify and hold harmless the United States with respect to any and all claims for damages or reimbursement arising from or on account of any contract, agreement, or arrangement between Respondent and any person for performance of Work on or relating to the Site, including, but not limited to, claims on account of construction delays.

XXV. MODIFICATIONS

68. The OSC may make modifications to any plan or schedule in writing or by oral direction not inconsistent with the National Contingency Plan. Any oral modification will be memorialized in writing by U.S. EPA promptly, but shall have as its effective date the date that the OSC communicates his/her direction to Respondent. Any other requirements of this Settlement Agreement may be modified in writing by mutual agreement of the parties.

69. If Respondent seeks permission to deviate from any approved work plan or schedule, Respondent's Project Coordinator shall submit a written request to U.S. EPA for approval outlining the proposed modification and its basis. Respondent may not proceed with the requested deviation until receiving oral or written approval from the OSC pursuant to Paragraph 68.

70. No informal advice, guidance, suggestion, or comment by the OSC or other U.S. EPA representatives regarding reports, plans, specifications, schedules, or any other writing submitted by Respondent shall relieve Respondent of its obligation to obtain any formal approval required by this Settlement Agreement, or to comply with all requirements of this Settlement Agreement, unless it is formally modified.

XXVI. NOTICE OF COMPLETION OF WORK

71. When U.S. EPA determines, after U.S. EPA=s review of the Final Report, that all Work has been fully performed in accordance with this Settlement Agreement, with the exception of any continuing obligations required by this Settlement Agreement, including, *e.g.*, post-removal site controls, payment of Response Costs, and record retention, U.S. EPA will provide written notice to Respondent. If U.S. EPA determines that any such Work has not been completed in accordance with this Settlement Agreement, U.S. EPA will notify Respondent, provide a list of the deficiencies, and require that Respondent modify the Work Plan if appropriate in order to correct such deficiencies. Respondent shall implement the modified and approved Work Plan and shall submit a modified Final Report in accordance with the U.S. EPA notice. Failure by Respondent to implement the approved modified Work Plan shall be a violation of this Settlement Agreement.

XXVII. FINANCIAL ASSURANCE

72. Within 30 days of the Effective Date, Respondent shall establish and maintain financial security in the amount of $ 450,000 in one or more of the following forms:

a. A surety bond guaranteeing performance of the Work;

b. One or more irrevocable letters of credit equaling the total estimated cost of the Work;

c. A trust fund;

d. A guarantee to perform the Work by one or more parent corporations or subsidiaries, or by one or more unrelated corporations that have a substantial business relationship with Respondent; or

e. A demonstration that Respondent satisfies the requirements of 40 C.F.R. Part 264.143(f). {NOTE: For these purposes, references in 40 C.F.R. ' 264.143(f) to the Asum of current closure and post-closure costs estimates and the current plugging and abandonment costs estimates@ shall mean the amount of financial security specified above. If any Respondent who seeks to provide a demonstration under 40 C.F.R. ' 264.143(f) has provided a similar demonstration at other RCRA or CERCLA sites, the amount for which they are providing financial assurance at those other sites should generally be added to the estimated costs of the Work for this Paragraph.}

73. If Respondent seeks to demonstrate the ability to complete the Work through a guarantee by a third party pursuant to Paragraph 72(a) of this Section, Respondent shall demonstrate that the guarantor satisfies the requirements of 40 C.F.R. § 264.143(f). If Respondent seeks to demonstrate its ability to complete the Work by means of the financial test or the corporate guarantee pursuant to Paragraph 72(d) or (e) of this Section, it shall resubmit sworn statements conveying the information required by 40 C.F.R. § 264.143(f) annually, on the anniversary of the Effective Date. In the event that U.S. EPA determines at any time that the

financial assurances provided pursuant to this Section are inadequate, Respondent shall, within 30 days of receipt of written notice of U.S. EPA=s determination, obtain and present to U.S. EPA for approval one of the other forms of financial assurance listed in Paragraph 72 of this Section. Respondent's inability to demonstrate financial ability to complete the Work shall not excuse performance of any activities required under this Settlement Agreement.

74. If, after the Effective Date, Respondent can show that the estimated cost to complete the remaining Work has diminished below the amount set forth in Paragraph 72 of this Section, Respondent may, on any anniversary date of the Effective Date, or at any other time agreed to by the Parties, reduce the amount of the financial security provided under this Section to the estimated cost of the remaining Work to be performed. Respondent shall submit a proposal for such reduction to U.S. EPA, in accordance with the requirements of this Section, and may reduce the amount of the security upon approval by U.S. EPA. In the event of a dispute, Respondent may reduce the amount of the security in accordance with the written decision resolving the dispute.

75. Respondent may change the form of financial assurance provided under this Section at any time, upon notice to and approval by U.S. EPA, provided that the new form of assurance meets the requirements of this Section. In the event of a dispute, Respondent may change the form of the financial assurance only in accordance with the written decision resolving the dispute.

XXVIII. INSURANCE

76. At least 7 days prior to commencing any on-Site work under this Settlement Agreement, Respondent shall secure, and shall maintain for the duration of this Settlement Agreement, comprehensive general liability insurance and automobile insurance with limits of ten million dollars, combined single limit. Within the same time period, Respondent shall provide U.S. EPA with certificates of such insurance and a copy of each insurance policy. In lieu of securing the specified insurance, Respondent may demonstrate that it is self-insured and has assets sufficient to address any liability for which such insurance was required. If Respondent elects to make such a demonstration then, each year within 90 days after the end of Respondent's fiscal year, Respondent shall submit to the United States (a) its annual financial statements (audited in accordance with U.S. Generally Accepted Accounting Principles) demonstrating that Respondent has 1) a net worth of not less than U.S. $2,000,000,000; 2) working capital of not less than U.S. $1,000,000,000; and 3) a debt to equity ratio of not more than 4.0; and (b) a letter signed by Respondent's chief financial officer (or other responsible corporate financial officer) confirming that Respondent satisfies the criteria set forth in items (1) through (3) above for its most recent completed fiscal year. If at any time after electing to make the demonstration set forth in the immediately preceding sentence Respondent fails to satisfy the criteria set forth in items (1) through (3) above, Respondent shall immediately notify EPA of such failure and shall promptly (and in any event within 90 days) secure the specified third-party insurance. In addition, for the duration of the Settlement Agreement, Respondent shall satisfy, or shall ensure that its contractors or subcontractors satisfy, all applicable laws and regulations regarding the provision of worker=s compensation insurance for all persons performing the

Work on behalf of Respondent in furtherance of this Settlement Agreement. If Respondent demonstrates by evidence satisfactory to U.S. EPA that any contractor or subcontractor maintains insurance equivalent to that described above, or insurance covering some or all of the same risks but in an equal or lesser amount, then Respondent need provide only that portion of the insurance described above which is not maintained by such contractor or subcontractor or demonstrate sufficient financial assets under the self-insurance program, as discussed above.

XXIX. SEVERABILITY/INTEGRATION/ATTACHMENTS

77. If a court issues an order that invalidates any provision of this Settlement Agreement or finds that Respondent has sufficient cause not to comply with one or more provisions of this Settlement Agreement, Respondent shall remain bound to comply with all provisions of this Settlement Agreement not invalidated or determined to be subject to a sufficient cause defense by the court=s order.

78. This Settlement Agreement and its attachments constitute the final, complete and exclusive agreement and understanding among the Parties with respect to the settlement embodied in this Settlement Agreement. The Parties acknowledge that there are no representations, agreements or understandings relating to the settlement other than those expressly contained in this Settlement Agreement. The following attachments are incorporated into this Settlement Agreement: Attachment A (Map of Site).

XXX. EFFECTIVE DATE

79. This Settlement Agreement shall be effective upon receipt by Respondent of a copy of this Settlement Agreement signed by the Director, Superfund Division, U.S. EPA Region 5.

The undersigned representative of Respondent certifies that he/she is fully authorized to enter into the terms and conditions of this Settlement Agreement and to bind the party they represent to this document.

Agreed this ____ day of _____, 2006.

For Respondent

By

Title _____

IN THE MATTER OF:

BEHR VOC PLUME SITE
DAYTON, OHIO

It is so ORDERED and Agreed this _____ day of _____, 2006.

BY: _____
Richard C. Karl, Director
Superfund Division
United States Environmental Protection Agency
Region 5

REMOVAL PROGRAM
106 CONSENT ORDER
ROUTING SLIP
(REVISED JUNE 2006)

Behr VOC Plume Site
(SITE NAME)

(Initial 106 Consent Order U.S. EPA transmittal to PRPs for signature.
Use when ERB Branch Chief signs cover letter.)

Please sign the Yellow and check your name off this page.
Then pass the document on to the next name.
Do not sign this page, SIGN THE YELLOW

	NAME	MAIL CODE
1. ERB ENFORCEMENT SPECIALIST	Carol Ropski	SE-5J
2. ERB ON-SCENE COORDINATOR	Steve Renninger	G-41
3. EESS SECRETARY	Akimi Cheng	SE-5J
4. ORC STAFF ATTORNEY	Maria Gonzalez	C-14J
5. ORC SECTION CHIEF	Sandra Lee	C-14J
6. EESS SECRETARY	Akimi Cheng	SE-5J
7. ERB RESPONSE SECTION CHIEF I	Jason El-Zein	SE-5J
8. EESS ACTING SECTION CHIEF	Ross Del Rosario	SE-5J
9. ERB 1 ACTING BRANCH SECRETARY	Mary Jane Adomo	SE-5J
10. ERB #2 BRANCH CHIEF	William Bolen	SE-5J
11. EESS SECRETARY FOR MAILING TO PRPS AND DISTRIBUTION OF BCC LIST	Akimi Cheng	SE-5J

DATE MAILED TO PRP's: _____
DATE SIGNED COPIES RETURNED FROM PRP'S

(Signed copies should be returned to the ERB for final routing; this sheet will be maintained in ERB until receipt of the signed copies from the PRPs.)

Behr VOC Plume Site

FEDERAL EXPRESS

Shawn R. DeMerse, JD, CHMM
Environmental Counsel
Office Of The General Counsel
DaimlerChrysler Corporation
CIMS 485-13-62
1000 Chrysler Drive
Auburn Hills, MI 48326-2766

Re: Behr VOC Plume Site
Dayton, Montgomery County, Ohio

Dear Mr. DeMerse:

Enclosed please find two copies of an Administrative Settlement Agreement and Order by Consent prepared by the U.S. Environmental Protection Agency ("U.S. EPA") under Section 106 of the Comprehensive Environmental Response, Compensation, and Liability Act of 1980, as amended, 42 U.S.C. '9606. Please return both executed copies of the consent order within 5 calendar days after receipt of this letter to Maria Gonzalez, Associate Regional Counsel, C-14J, 77 West Jackson Boulevard, Chicago, Illinois 60604. Your failure to return two executed copies of the consent order to U.S. EPA within that time period will be construed as an unwillingness to enter a consent order with U.S. EPA. U.S. EPA will then proceed accordingly.

If you have any questions regarding the Order, feel free to contact Maria Gonzalez Associate Regional Counsel, at (312) 886-6630 or Steve Renninger, On-Scene Coordinator, at (513) 569-7539.

Sincerely yours,

William Bolen, Chief
Emergency Response Branch #1

Enclosures

cc: Jon S. Faletto
Hinshaw & Colbertson LLP

Ms. Cindy Hafner, Chief Dvision of Emergency & Remedial Response
Ohio Environmental Protection Agency

bcc: Docket Analyst, ORC (C-14J)
Maria Gonzalez, ORC (C-14J)
Steve Renninger (SE-5J)
John Maritote, EESS (SE-5J)
Carol Ropski, EESS (SE-5J)
Betty White, PAAS (MF-10J)
Records Center (SMR-7J)
Denise Gawlinski, Public Affairs (P-19J) w/out attachments
Michael T. Chezik, Department of Interior
OSRE (only if costs are compromised) (2272A)

ATTACHMENT B

Attachment B

Health and Safety Plan

HEALTH AND SAFETY PLAN

Behr VOC Plume Site
Dayton, Ohio 45409

Prepared for:

Daimler Chrysler
800 Chrysler Drive
Auburn Hills, Michigan 48326

Prepared by:

Earth Tech, Inc.
5555 Glenwood Hills Parkway
Grand Rapids, Michigan 49512

December 2006

Project No: 63787.84.50

HEALTH AND SAFETY PLAN APPROVAL

This Health and Safety Plan (HASP) was prepared for employees performing a specific, limited scope of work. It was prepared based on the best available information regarding the physical and chemical hazards known or suspected to be present on the project site. While it is not possible to discover, evaluate, and protect in advance against all possible hazards, which may be encountered during the completion of this project, adherence to the requirements of the HASP will significantly reduce the potential for occupational injury.

By signing below, I acknowledge that I have reviewed and hereby approve the HASP for the Behr VOC Plume Site. This HASP has been written for the exclusive use of Earth Tech, Inc., its employees, and subcontractors. The plan is written for specified site conditions, dates, and personnel, and must be amended if these conditions change.

Written by:

Ryan Wolschleger

11-30-06

Ryan Wolschleger, ASP, OHST — Date

Safety Professional

Approved by:

Justin Kelley — Date

Project Manager

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1.0 INTRODUCTION

This Health and Safety Plan (HASP) (including Attachments A-E) provides a general description of the levels of personal protection and safe operating guidelines expected of each employee or subcontractor associated with the environmental services being conducted at the Behr VOC Plume Site. The Site consists of select residential properties in the vicinity of the Behr Dayton Thermal Products Facility located at 1600 Webster Street in Dayton, Ohio (Behr-Dayton facility). This HASP addresses residential properties bounded by the following geographic area: Leo Street to the north, Lamar Street to the south, Webster Street to the west, and Milburn Avenue to the east. This HASP also identifies chemical and physical hazards known to be associated with the Earth Tech-managed activities addressed in this document.

HASP Supplements will be generated as necessary to address any additional activities or changes in site conditions which may occur during field operations. Once generated, each Supplement will be inserted in Attachment E and reviewed/acknowledged by field personnel prior to the start of applicable work activities.

1.1 GENERAL

The provisions of this HASP are mandatory for all Earth Tech personnel engaged in fieldwork associated with the environmental services being conducted at the subject site. A copy of this HASP, any applicable HASP Supplements and the Earth Tech Safety, Health & Environmental (SH&E) Standard Operating Procedures (SOPs) shall be maintained on site and available for review at all times. Record keeping will be maintained in accordance with this HASP and the applicable SH&E SOPs. In the event of a conflict between this HASP, the SOPs and federal, state, and local regulations, workers shall follow the most stringent/protective requirements.

1.2 POLICY STATEMENT

Earth Tech has developed ten "Core Values", which form the foundation of our Safety Management System. These Core Values were developed for two basic reasons:

1. To communicate the company's basic safety tenets to Earth Tech employees, partners, and customers; and
2. To serve as a constant reminder for every Earth Tech staff member that our everyday business and operational decisions must be made in concert with these tenets.

The Core Values will be posted at the site in a common area and communicated to all employees prior to beginning work activities.

Earth Tech maintains the following goals for all operations:

- **Zero** work-related injuries or illnesses.
- **Zero** damage to property, and/or equipment from our activities.
- **Zero** releases to the environment from our ongoing projects.

1.3 REFERENCES

This HASP meets the regulatory requirements and guidelines established in the following documents:

- Title 29, Part 1910 of the Code of Federal Regulations (29 CFR 1910), *Occupational Safety and Health Standards* (with special attention to Section 120, *Hazardous Waste Operations and Emergency Response*).
- Title 29, Part 1926 of the Code of Federal Regulations (29 CFR 1926), *Safety and Health Regulations for Construction.*
- National Institute for Occupational Safety and Health (NIOSH)/OSHA/U.S. Coast Guard (USCG)/EPA, *Occupational Safety and Health Guidance Manual for Hazardous Waste Site Activities*, Publication No. 85-115, 1985.

1.3.1 Earth Tech Safety, Health and Environmental Website

Earth Tech's Safety Website is located on the Earth Tech Corporate Intranet, and is available for all Earth Tech employees as a resource for safety information, updates, and procedures. Project management and employees are encouraged to visit the website for key safety items and information, such as:

- The Earth Tech Employee Orientation,
- Contact information for Earth Tech's Safety Department staff,
- Safety Forms,
- Safety Program Manuals,
- Safety Alerts and other communications,
- Accident, Injury, and Near-Miss Reporting Requirements,
- e-Tracking
- Links to safety and regulatory information,
- Training Resources,
- Ergonomics Information, and
- A feedback link to the Earth Tech Safety Director.

The website is located at the following web address:

http://etonline.earthtech.com/etonline/healthsafety/

Please note that the website can only be accessed when connected to Earth Tech's Wide-Area Network (e.g., via iPass).

2.0 SITE INFORMATION AND SCOPE OF WORK

Earth Tech will conduct environmental services at the Behr VOC Plume Site. Work will be performed in accordance with the applicable Statement of Work (SOW) and associated Work Plans developed for the Behr VOC Plume Site. Deviations from the listed SOW will require that a Safety Professional review and changes made to this HASP, to ensure adequate protection of personnel and other property.

The following is a summary of relevant data concerning the Behr VOC Plume Site, and the work procedures to be performed. The Work Plan, prepared by Earth Tech as a companion document to this HASP, provides significantly greater details concerning both site history and planned work operations.

2.1 SITE INFORMATION

This section provides a general description and historical information associated with the site.

2.1.1 General Description

The Site consists of select residential properties in the vicinity of the Behr-Dayton facility. The residential properties are bounded by the following geographic area: Leo Street to the north, Lamar Street to the south, Webster Street to the west, and Milburn Avenue to the east. All work will be performed within these residential properties. The VOC plume is related to the Behr-Dayton facility located at 1600 Webster Street.

2.1.2 Site Background/History

The work to be conducted under this HASP is related to a trichloroethylene (TCE) contaminated groundwater plume which has migrated south-southwest of the Behr-Dayton facility and beneath the residential properties bounded by the streets mentioned above.

TCE contaminated groundwater has migrated to the south to of Leo Street and delineated generally by Webster Street on the west, Lamar Street on the south, and Milburn Avenue on the east. Groundwater in this area is located approximately 20 feet below ground surface (bgs).

2.1.3 Previous Investigations

On October 16, 2006, Ohio EPA installed a total of seven soil gas probes along Daniel Street, Lamar Street and Milburn Avenue to evaluate potential risk posed by vapor intrusion from a volatile organic compound (VOC) groundwater plume. The depth of the soil gas probes were approximately one to two feet above the depth of groundwater (20 feet bgs). Once the soil probes were installed, an air sample was collected and analyzed for VOCs using EPA Method TO-14 modified. TCE concentrations in soil gas were detected at levels ranging from 12 to 160 parts per million (ppm).

At the request of Ohio EPA, the U.S. EPA conducted a simultaneous vapor intrusion investigation. In October and November 2006, the U.S. EPA collected sub-slab air samples from eight residences located south of Leo Street along Milburn Avenue and Daniel Street. TCE concentrations were detected at levels ranging from 260 to 62,000 parts per billion by volume (ppbv).

The results of the sub-slab testing indicated that eight samples exceed the ATSDR TCE sub-slab screening level of 4 ppbv and four samples exceed the ATSDR TCE sub-slab immediate action level of 1,000 ppbv.

Based on ATSDR and ODH recommendations, U.S. EPA collected indoor air samples from the eight residences located south of Leo Street along Milburn Avenue and Daniel Street. TCE concentrations were detected at concentrations ranging from 0.4 to 260 ppbv.

The results of the indoor air testing indicated that eight samples exceed the ATSDR and ODH TCE indoor screening action level of 0.4 ppbv and three samples exceed the ATSDR and ODH TCE indoor immediate action level of 100 ppbv.

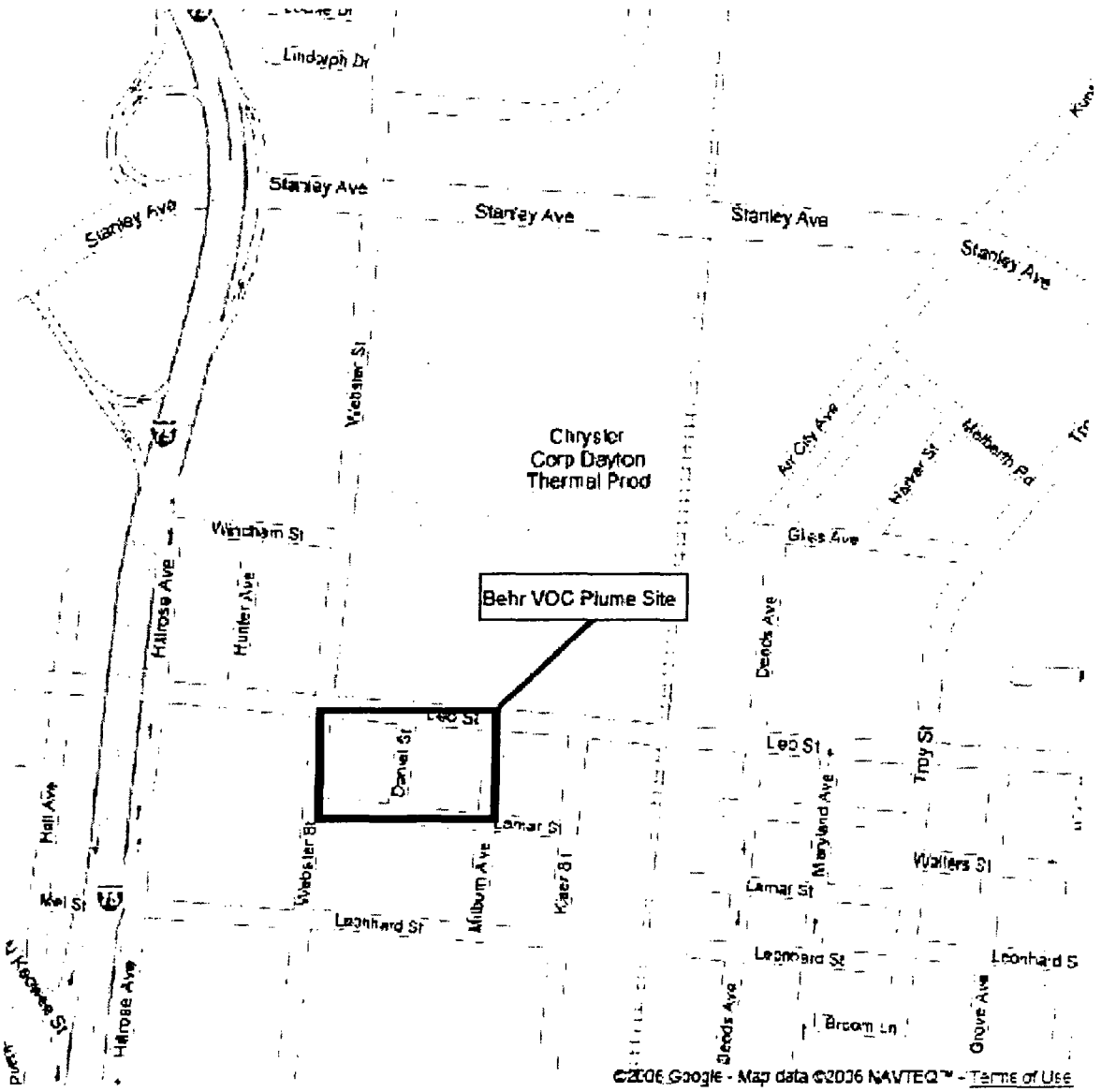
Refer to section 5 of this HASP for additional information.

2.2 SCOPE OF WORK

Earth will perform the following tasks:

- Mobilization/demobilization/site set-up.
- Installation of sub-slab vapor probes and collecting indoor air and sub-slab SUMMA™ canister samples.
- Subcontractor oversight of sub-slab depressurization systems in residential homes.

Figure 2-1. Site Map



3.0 PROJECT HEALTH AND SAFETY ORGANIZATION

3.1 PROJECT MANAGER [Justin Kelley]

The Project Manager (PM) has overall management authority and responsibility for all site operations, including safety. The specific safety responsibilities for the PM are listed in Section 4.0 of SH&E 003, *Operational Structure*. The PM will provide the site supervisor with the appropriate work plans for the site.

3.2 SITE SUPERVISOR [Scott Stacy]

The site supervisor has the overall responsibility and authority to direct work operations at the job site according to the provided work plans. The PM may act as the site supervisor while on site.

3.2.1 Responsibilities

The site supervisor is responsible to:

- Discuss deviations from the work plan with the SSO and PM.
- Discuss safety issues with the PM, Site Safety Officer (SSO), and field personnel.
- Assist the SSO with the development and implementation of corrective actions for site safety deficiencies.
- Assist the SSO with the implementation of this HASP and ensuring compliance.
- Assist the SSO with inspections of the site for compliance with this HASP and applicable SH&E SOPs.

3.2.2 Authority

The site supervisor has authority to:

- Verify that all operations are in compliance with the requirements of this HASP, and halt any activity which poses a potential hazard to personnel, property or the environment.
- Temporarily suspend individuals from field activities for infractions against the HASP pending consideration by the SSO, the Safety Professional, and the PM.

3.2.3 Qualifications

In addition to being Hazardous Waste Operations and Emergency Response (HAZWOPER)-qualified (see Section 4.1), the Site Supervisor is required to have completed an 8-hour HAZWOPER Supervisor Training Course in accordance with 29 CFR 1910.120 (e)(4) within the past three (3) years.

3.3 SITE SAFETY OFFICER [Scott Stacy]

Scott Stacy has been assigned to fulfill the duties of the Site Safety Officer (SSO). If the SSO must leave the site during field activities, an alternate SSO will be selected by name and informed of his/her duties (see below).

3.3.1 Responsibilities

The SSO is responsible to:

- Update the site-specific HASP to reflect changes in site conditions or the scope of work. HASP updates must be reviewed and approved by the Safety Professional.
- Be aware of changes in Earth Tech Safety Policy. Changes are posted on the Earth Tech Safety Website (see Section 1.3 of this HASP).
- Monitor the lost time incidence rate for this project and work toward improving it.
- Inspect the site for compliance with this HASP and the SH&Es using the appropriate audit inspection checklist provided by an Earth Tech Safety Professional.

- Work with the PM to develop and implement corrective action plans to correct deficiencies discovered during site inspections. Deficiencies will be discussed with project management to determine appropriate corrective action(s).
- Contact the Safety Professional for technical advice regarding safety issues.
- Provide a means for employees to communicate safety issues to management in a discreet manner (i.e., suggestion box, etc.).
- Determine emergency evacuation routes, establishing and posting local emergency telephone numbers, and arranging emergency transportation
- Ensure that all site personnel and visitors have received the proper training and medical clearance prior to entering the site
- Establish any necessary controlled work areas (as designated in this HASP or other safety documentation)
- Initiate tailgate safety meetings and maintain attendance logs and records
- Discuss potential health and safety hazards with the site supervisor, the Safety Professional, and the PM
- Select an alternate SSO by name and inform him/her of their duties, in the event that the SSO must leave or is absent from the site.

3.3.2 Authority

The SSO has authority to:

- Verify that all operations are in compliance with the requirements of this HASP.
- Issue a "Stop Work Order" under the conditions set forth in Section 4.8 of this HASP.
- Temporarily suspend individuals from field activities for infractions against the HASP pending consideration by the site supervisor, Safety Professional and the PM.

3.3.3 Qualifications

In addition to being HAZWOPER-qualified (see Section 4.1), the SSO is required to have completed an 8-hour HAZWOPER Supervisor Training Course in accordance with 29 CFR 1910.120 (e)(4).

3.4 EMPLOYEES

3.4.1 Employee Responsibilities

Responsibilities of employees associated with this project include, but are not limited to:

- Immediately report any injury, illness, or safety incident to the SSO or site supervisor/PM.
- Notifying the SSO, in writing or verbally, of unsafe conditions and acts.
- Understanding and abiding by the policies and procedures specified in the HASP and other applicable safety policies, and clarifying those areas where understanding is incomplete.
- Providing feedback to health and safety management relating to omissions and modifications in the HASP or other safety policies.

3.4.2 Employee Authority

The health and safety authority of each employee assigned to the site includes the following:

- The right to refuse to work and/or stop work authority when the employee feels that the work is unsafe (including subcontractors or team contractors), or where specified safety precautions are not adequate or fully understood.
- The right to refuse to work on any site or operation where the safety procedures specified in this HASP or other safety policies are not being followed.
- The right to contact the SSO or the Safety Professional at any time to discuss potential concerns.

3.5 SAFETY PROFESSIONAL

The Safety Professional is the member of the Earth Tech Safety, Health and Environmental Department assigned to oversee health and safety requirements for the project and provide any needed technical support. The Safety Professional will be the first point-of-contact for all of the project's health and safety matters. Duties include the following:

- Approving this HASP and any required changes.
- Approving of the designated SSO (if site supervisor does not cover SSO duties).
- Providing sound technical safety support.
- Reviewing all personal exposure monitoring results.
- Investigating any reported unsafe acts or conditions.

3.6 SUBCONTRACTORS

The requirements for subcontractor selection and subcontractor safety responsibilities are outlined in SH&E 207, *Contractor and Subcontractor SH&E Requirements*. Each Earth Tech subcontractor is responsible for assigning specific work tasks to their employees. Each subcontractor's management will provide qualified employees and allocate sufficient time, materials, and equipment to safely complete assigned tasks. In particular, each subcontractor is responsible for equipping its personnel with any required personnel protective equipment (PPE).

Earth Tech considers each subcontractor to be an expert in all aspects of the work operations for which they are tasked to provide, and each subcontractor is responsible for compliance with the regulatory requirements that pertain to those services. Each subcontractor is expected to perform its operations in accordance with its own unique safety policies and procedures, in order to ensure that hazards associated with the performance of the work activities are properly controlled. Copies of any required safety documentation for a subcontractor's work activities will be provided to Earth Tech for review prior to the start of onsite activities, if required.

Hazards not listed in this HASP but known to any subcontractor, or known to be associated with a subcontractor's services, must be identified and addressed to the Earth Tech PM or the Site Supervisor prior to beginning work operations. The Site Supervisor or authorized representative has the authority to halt any subcontractor operations, and to remove any subcontractor or subcontractor employee from the site for failure to comply with established health and safety procedures or for operating in an unsafe manner.

The subcontractor to be used at this Site is Air Quality Systems. Safety documentation for this subcontractor is included in Attachment E.

3.7 VISITORS

Authorized visitors (e.g., client representatives, regulators, Earth Tech management staff, etc.) requiring entry to any work location on the site will be briefed by the RM on the hazards present at that location. Visitors will be escorted by the site supervisor or designee at all times at the work location and will be responsible for compliance with their employer's health and safety policies. In addition, this HASP specifies the minimum acceptable qualifications, training and personal protective equipment which hare required for entry to any controlled work area; visitors must comply with these requirements at all times.

Unauthorized visitors, and visitors not meeting the specified qualifications, will not be permitted within established controlled work areas.

4.0 SAFETY PROGRAMS

4.1 SH&E STANDARD OPERATING PROCEDURES

SH&E standard operating procedures (SOPs) have been developed as guidance documents for specific work tasks and overall SH&E management. In the table below, SOPs containing specific information regarding tasks anticipated for this project have been identified. A copy of the SH&E SOP Manual must accompany this HASP.

Table 4-1. Applicable SOPs

	SOP #	TOPIC		SOP #	TOPIC
		SH&E 000 Series			**SH&E 200 Series**
☒	001	SH&E Policy Statement	☒	201	General Safety Rules
☒	002	SH&E Dept. Structure & Responsibilities	☒	202	Safety Meetings
☒	003	Operational SH&E Structure & Responsibilities	☒	203	Accident Prevention Program – Requirements for SH&E Documentation
☒	004	SH&E Administration Support	☒	204	Task Hazard Analysis
☒	005	Review of Safety Manual	☒	205	Emergency Action Planning & Prevention
		SH&E 100 Series	☒	206	Stop Work Authority
☒	101	Injury, Illness, & Near Miss Reporting	☒	207	Contractor & Subcontractor SH&E Requirements
☒	102	Incident Investigation and Review	☒	208	General Housekeeping, Hygiene, and Sanitation
☐	103	Regulatory Agency Inspections	☒	209	Disciplinary Actions/Accountability
☒	104	SH&E Audits, Inspections, and Corrective Actions	☒	210	Walking-Working Surfaces Protection
☒	105	SH&E Procedure Variance			**SH&E 300 Series**
☒	106	Drug-Free Workplace Program	☒	301	Hazardous Waste Operations (HAZWOPER)
☐	107	Modified Duty Program	☐	302	Office Safety
☒	108	Medical Monitoring & Surveillance	☐	303	OE and UXO Operations
☒	109	Hearing Conservation Program	☐	304	Landfill Quality Assurance and Operations
☐	110	Fetal Protection Program	☐	305	Demolition Operations
☒	111	Employee Exposure Monitoring Program	☐	306	Structural Steel Operations
☒	112	Respiratory Protection Program	☐	307	Underground Construction & Tunneling
☒	113	Personal Protective Equipment (PPE)	☐	308	Rail Operations
☒	114	Safety Training Programs	☐	309	Marine Operations - Working On/Near Water
☒	115	Hazard Communication Program	☒	310	Overhead Electrical Lines
☒	116	Driver and Vehicle Safety	☐	311	Blasting and Use of Explosives
☐	117	Commercial Vehicle Program			**SH&E 400 Series**
☐	118	Confined Space Entry Program	☐	401	Clearing & Grubbing
☒	119	Lock-Out / Tag-Out Program	☐	402	Excavation & Trenching
☒	120	Fall Protection Program	☒	403	Drilling
☒	121	Electrical Safety Program	☒	404	Manual Lifting
☒	122	Environmental Compliance Program	☐	405	Handling Drums & Large Containers
☒	123	Ergonomics Program	☐	406	Drum Sampling
☒	124	Heat Stress Prevention Program	☐	407	Tank & Large Container Sampling
☒	125	Cold Stress Prevention Program	☐	408	Unknown Hazardous Waste Drum Handling
☐	126	Radiation Safety Program	☐	409	Tank Cleaning
☐	127	Radiation Protection Plans	☐	410	Tank Removal & Demolition
☐	128	Radiological Exposure Assessment	☐	411	Welding, Cutting, & other Hot Work
☐	129	ALARA	☐	412	Line Entry
☐	130	Non-Ionizing Radiation	☐	413	Cylinder Disposition & Decommissioning
☐	131	Safety Assessment Program	☐	414	Pile Driving
☒	132	Competent Persons	☐	415	Abrasive Blasting

APPLICABLE STANDARD OPERATING PROCEDURES (continued)

	SOP #	TOPIC		SOP #	TOPIC
		SH&E 500 Series			**SH&E 400 Series (continued)**
☒	501	Ladders	☐	416	Concrete & Masonry Work
☐	502	Scaffolding	☐	417	Automotive Service Operations
☐	503	Machine Guarding	☐	418	Spray Finishing & Dip Tanks
☐	504	Woodworking and Metalworking Machines	☐	419	Cleanup of Bird Excrement/Amplified Fungal Growth
☒	505	Powered Hand Tools			**SH&E 600 Series**
☒	506	Manual Hand Tools	☒	601	Hazardous Materials Shipping
☐	507	Powder-Actuated Tools	☐	602	Process Safety Management
☒	508	Fire Extinguishers	☐	603	Chemical Hygiene Plan
☐	509	Refuse Packer Units	☒	604	Decontamination
☒	510	High Pressure Washers	☐	605	Protection from Solvents
☐	511	All Terrain Vehicles	☒	606	Flammable & Combustible Materials
☐	512	Forklifts	☒	607	Chemical and Biological
☐	513	Heavy Equipment	☒	608	Blood-Borne Pathogens
☐	514	Manlifts	☐	609	Asbestos
☐	515	Cranes, Lifting Devices & Rigging Requirements	☐	610	Lead
☒	516	Equipment Safety Cards	☐	611	Cadmium
☒	517	Traffic Safety	☐	612	Compressed Gases

4.2 HAZWOPER QUALIFICATIONS

Personnel performing work art the job site must be qualified as HAZWOPER workers (unless otherwise noted in specific THAs or by the SSO), and must meet the medical monitoring and training requirements specified in the following safety procedures:

- SH&E 108, *SH&E Medical Monitoring and Surveillance.*
- SH&E 301, *Hazardous Waste Operations (HAZWOPER)*

Personnel must have successfully completed training meeting the provisions established in 29 CFR 1910.120 (e)(2) and (e)(3) (40-hour initial training). As appropriate, personnel must also have completed annual refresher training in accordance with *29 CFR 1910.120* (e)(8); each person's most recent training course must have been completed within the previous 365 days. Personnel must also have completed a physical exam in accordance with the requirements of 29 CFR 1910.120 (f), where the medical evaluation includes a judgment of the employee's ability to use respiratory protective equipment and to participate in hazardous waste site activities. These requirements are further discussed in SH&E 301, *Hazardous Waste Operations.*

If site monitoring procedures indicate that a possible exposure has occurred above the OSHA permissible exposure limit (PEL), employees may be required to receive supplemental medical testing to document specific to the particular materials present.

A summary of Earth Tech personnel that are working on this project and their HAZWOPER certifications are listed in the following table:

Table 4-2. Earth Tech Personnel and HAZWOPER Certifications

EMPLOYEE NAME	DATE OF 40-HOUR HAZWOPER TRAINING	DATE OF 8-HOUR HAZWOPER SUPERVISOR TRAINING	DATE OF 8-HOUR HAZWOPER REFRESHER	DATE OF MEDICAL MONITORING
Scott Stacy	May 12, 2000	April 1, 2005	June 27, 2006	March 30, 2006

Safety documentation for this employee is included in Attachment E.

4.3 SAFETY TRAINING

The following SH&E SOPs contain specific training requirements applicable to all operations:

1. SH&E 109, *Hearing Conservation*
2. SH&E 112, *Respiratory Protection*
3. SH&E 113, *Personal Protective Equipment*
4. SH&E 114, *Safety Training Programs*
5. SH&E 115, *Hazard Communication Program*
6. SH&E 116, *Driver and Vehicle Safety*
7. SH&E 119, *Lockout-Tagout*
8. SH&E 202, *Safety Meetings*
9. SH&E 204, *Task Hazard Analyses*
10. SH&E 204, *Emergency Action Planning and Prevention*
11. SH&E 601, *Hazardous Materials Shipping*

For this project, the training required to perform work includes:

1. HAZWOPER 40-hour and current 8-hour refresher,
2. 8-hour Supervisor (at least one person on site),
3. Hearing Conservation,
4. Respiratory Protection,
5. Site-Specific training/orientation (See Below),
6. First Aid/CPR training (at least one person on site), and

The SSO (or designee) will confirm that all appropriate training requirements have been achieved and maintained appropriately. Refer to Section 4.3.1 below for site specific training requirements.

4.3.1 Site-Specific Training/Orientation

In addition to the general health and safety training programs, personnel will be provided with a site-safety orientation to include:

1. HASP: Instructed on the contents of applicable portions of this HASP and THAs developed for the tasks to be performed.

2. Hazard Communication: Informed about the potential routes of exposure, protective clothing, precautionary measures, and symptoms or signs of chemical exposure and heat stress.
3. Hazards and Recognition: Made aware of task-specific physical, chemical, biological hazards and other hazards that may be encountered during site work. This includes any potential confined space and lockout/tagout procedures.
4. Air Monitoring: Made aware of air monitoring requirements, including where to locate action levels.
5. Emergency Response Plan: Made aware of emergency response procedures.

The orientation will be documented by the signing-off of the HASP once all of the above topics have been reviewed by the employee and RM.

4.4 HAZARD COMMUNICATION

Section 5.2 provides information concerning the materials that may be encountered as environmental contaminants during the work activities. In addition, any organization wishing to bring any hazardous material onto any Earth Tech-controlled work site must first provide a copy of the item's Material Safety Data Sheet (MSDS) to the SSO for approval and filing (the SSO will maintain copies of all MSDSs on site). MSDSs may not be available for locally-obtained products, in which case some alternate form of product hazard documentation will be acceptable. In accordance with the requirements of SH&E 115, *Hazard Communication Program,* all personnel shall be briefed on the hazards of any chemical product they use, and shall be aware of and have access to all MSDSs.

All containers on site shall be properly labeled to indicate their contents. Labeling on any containers not intended for single-day, individual use shall contain additional information indicating potential health and safety hazards (flammability, reactivity, etc.).

Attachment B provides copies of MSDSs for those items planned to be brought on site at the time this HASP is prepared. This information will be updated as required during site operations.

4.5 HAZARDOUS, SOLID, OR MUNICIPAL WASTE

If hazardous, solid and/or municipal wastes are generated during any phase of the project, the waste shall be accumulated, labeled, and disposed of in accordance with applicable Federal, State, and/or local regulations.

4.6 GENERAL SAFETY RULES

All site personnel shall adhere to SH&E 201, *General Safety Rules*, during site operations. In addition, the housekeeping and personal hygiene requirements listed below will also be observed.

4.6.1 Housekeeping

During site activities, work areas will be continuously policed for identification of excess trash and unnecessary debris. Excess debris and trash will be collected and stored in an appropriate container (e.g., plastic trash bags, garbage can, roll-off bin) prior to disposal. At no time will debris or trash be intermingled with waste PPE or contaminated materials.

4.6.2 Smoking, Eating, or Drinking

Smoking, eating and drinking will not be permitted inside any controlled work area at any time. Field workers will first wash hands and face immediately after leaving controlled work areas (and always prior to eating or drinking). Consumption of alcoholic beverages is prohibited at any Earth Tech site.

4.6.3 Personal Hygiene

The following personal hygiene requirements will be observed:

Water Supply: A water supply meeting the following requirements will be utilized:

Potable Water - An adequate supply of potable water will be available for field personnel consumption. Potable water can be provided in the form of water bottles, canteens, water coolers, or drinking fountains. Where drinking fountains are not available, individual-use cups will be provided as well as adequate disposal containers. Potable water containers will be properly identified in order to distinguish them from non-potable water sources.

Non-Potable Water - Non-potable water may be used for hand washing and cleaning activities. Non-potable water will not be used for drinking purposes. All containers of non-potable water will be marked with a label stating:

Non-Potable Water
Not Intended for Drinking Water Consumption

Toilet Facilities: A minimum of one toilet will be provided for every 20 personnel on site, with separate toilets maintained for each sex except where there are less than 5 total personnel on site. For mobile crews where work activities and locations permit transportation to nearby toilet facilities on-site facilities are not required.

Washing Facilities: Employees will be provided washing facilities at each work location. The use of water and hand soap (or similar substance, such as wipes) will required by all employees following exit from the Exclusion Zone, prior to breaks, and at the end of daily work activities.

4.6.4 Buddy System

All field personnel will use the buddy system when working within any controlled work area. Personnel belonging to another organization on site can serve as "buddies" for Earth Tech personnel. Under no circumstances will any employee be present alone in a controlled work area.

4.6.5 Heat and Cold Stress

Heat and cold stress may vary based upon work activities, PPE/clothing selection, geographical locations, and weather conditions. To reduce the potential of developing heat/cold stress, be aware of the signs and symptoms of heat/cold stress and watch fellow employees for signs of heat/cold stress. For additional requirements, refer to SH&E 124, *Heat Stress*, and SH&E 125, *Cold Stress*.

4.6.5.1 Solar Protection

To protect against exposure to solar radiation, workers will observe the following requirements:

1. All workers will wear sunglass-type safety glasses (Z87.1 approved) at all times when working outdoors during daylight hours.
2. Workers will utilize a commercial sunblock with a minimum solar protection factor (SPF) of 15.

4.7 STOP WORK AUTHORITY

All employees have the right and duty to stop work when conditions are unsafe, and to assist in correcting these conditions. Whenever the SSO determines that workplace conditions present an uncontrolled risk of injury or illness to employees, immediate resolution with the appropriate supervisor shall be sought. Should the supervisor be unable or unwilling to correct the unsafe conditions, the SSO is authorized and required to stop work, which shall be immediately binding on all affected Earth Tech employees and subcontractors.

Upon issuing the stop work order, the SSO shall implement corrective actions so that operations may be safely resumed. Resumption of safe operations is the primary objective; however, operations shall not resume until the Safety Professional has concurred that workplace conditions meet acceptable safety standards.

4.8 CLIENT SPECIFIC SAFETY REQUIREMENTS

The client has specified no additional health and safety requirements.

5.0 HAZARD ASSESSMENT

5.1 TASK HAZARD ANALYSIS

Task hazard analysis (THA) is a technique used to identify hazards and hazard controls associated with a specific job function. THAs focus on the relationship between the workers, the task, the resources required to complete the task, and the work environment. These variables must be evaluated to identify the potential hazards associated with the task. Once identified, steps can be taken to eliminate, reduce, or control the hazards to an acceptable risk level.

Section 2.2 lists the work activities anticipated during this project. Individual THAs for the tasks associated with this work can be found in Attachment A. Refer to SH&E 204, *Task Hazard Analyses* for additional THA requirements.

5.1.1 Unanticipated Work Activities/Conditions

Operations at the site may require additional tasks not identified in Section 2.2 or addressed in Attachment A, THAs. Before performing any task not covered in this HASP a THA must be prepared, and approved by the Safety Professional.

5.2 ENVIRONMENTAL CONTAMINANT EXPOSURE HAZARDS

The following is a discussion of the hazards presented to worker personnel during this project from on-site chemical and radiological hazards known or suspected to be present on site. Hazards associated with chemical products brought to the site during work operations are addressed separately, under the Hazard Communication process described in Section 4.3.

Exposure symptoms and applicable first aid information for each suspected site contaminant listed in Section 2 are located in the following subsections. Additional data is provided in Chemical Safety Cards, located in Attachment C.

5.2.1 Tetrachloroethylene (PCE)

See Chemical Safety Cards in Attachment C.

5.2.2 Trichloroethylene (TCE)

See Chemical Safety Cards in Attachment C.

5.2.3 Assessment of Exposure Hazards

Inhalation – Previous site activities indicate that a moderate inhalation exposure risk exists during intrusive operation and may require an upgrade in respiratory protection based on exposure symptoms and air monitoring results. Each task will be assessed for inhalation exposure risk and controls and will be identified on the associated THAs.

Skin Contact – Previous sampling events indicate that a significant skin contact exposure risk exists during intrusive and maintenance activities. Each task will be assessed for skin exposure risk and controls and will be identified on the associated THAs.

Ingestion – Previous sampling events indicate that a moderate ingestion exposure risk exists during intrusive and maintenance activities. Protection against exposure via ingestion can be accomplished by performance of proper decontamination procedures when exiting contaminated work areas (see Section 8.2) and by following strict hygiene practices while working in controlled work zones.

5.3 PHYSICAL HAZARDS

The following general physical hazards may be encountered during operations at the Behr VOC Plume Site:

- ***Hazardous Noise:*** Produced during heavy equipment operations, material handling and container handling/staging activities that may be ongoing around the work site.

- ***Walking/Working Surfaces:*** Unsafe, wet and/or elevated walking surfaces.
- ***Vehicle Operation Hazards:*** Associated with the operation of heavy equipment (including cranes), support/sampling equipment and vehicles.
- ***Electrical and Other Powered Machine Hazards:*** Present during both the operation and maintenance of site support equipment, including the hammer drill used for installing sub-slab vapor probes.
- ***Heat and Cold Stress Environments:*** Associated with site-specific work activities, PPE usage and geographical project locations.
- ***Utilities:*** Overhead and underground utilities may result in fire, explosion, electrocution, etc. if contacted by personnel or equipment.

Specific hazards will be identified in THAs and during site inspections, etc. and communicated to personnel. Identified hazards will be discussed with the PM, site supervisor, and SSO to establish appropriate safety controls and methods necessary to protect personnel from injury or illness and to prevent loss of property.

5.4 BIOLOGICAL HAZARDS

Biological hazards present a unique obstacle to personnel performing operations involving bio-hazardous materials or working in environments that contain biological hazards. Protection must be identified and provided when biological hazards are anticipated. Specific SH&E requirements can be found in the following SOPs:

1. SH&E 201, General Safety Requirements
2. SH&E 608, Blood-borne Pathogens

Contact with bodies of water, animals, insects, and plants can cause injury and illness to personnel. Care must be taken to ensure that these types of injuries are avoided. Some examples of biological hazards include:

- Wild animals, such as snakes, raccoons, squirrels, and rats. These animals not only can bite and scratch, but can carry transmittable diseases (e.g., rabies). Avoid the animals whenever possible. If bitten, go to the nearest medical facility.
- Insects such as mosquitoes, ticks, bees, and wasps. Mosquitoes can potentially carry and transmit the West Nile Virus. Ticks can transmit Lyme disease or Rocky Mountain Spotted Fever. Bees and wasps can sting by injecting venom, which causes some individuals to experience anaphylactic shock (extreme allergic reaction). Whenever you will enter areas that provide a habitat for insects (e.g., grass areas, woods), wear light-colored clothing, long pants and shirt, and spray exposed skin areas with a DEET-containing repellent. Keep away from high grass wherever possible. Keep your eyes and ears open for bee and wasp nests. If bitten by insects, see a doctor if there is any question of an allergic reaction.
- Plants such as poison ivy and poison oak can cause severe rashes on exposed skin. Be careful where you walk, wear long pants, and minimize touching exposed skin with your hands after walking through thickly vegetated areas until after you have thoroughly washed your hands with soap and water.

6.0 ACTIVITY SPECIFIC REQUIREMENTS

6.1 SUPPLEMENTAL SAFETY PROCEDURES

As discussed in Section 5.0, personnel may be exposed to a variety of chemical, physical, and biological hazards. The requirements for the control of many of these hazards these hazards is discussed in SH&E SOP Manual. Specifically, the 300, 400, 500, and 600 series of the SH&E SOP Manual provide specific information regarding hazard control and the requirements necessary to complete tasks in a safe manner.

6.1.1 Utilities

Various forms of underground/overhead utility lines or pipes may be encountered during site activities. Prior to the start of intrusive operations, utility clearance is mandated, as well as obtaining authorization from all concerned public utility department offices. Should intrusive operations cause equipment to come into contact with utility lines, the SSO and an Earth Tech SH&E Professional will be notified immediately. Work will be suspended until the applicable utility agency is contacted and the appropriate actions for the particular situations can be taken. For this site, the applicable agency is OUPS. The phone number is provided in the Emergency Contacts list found in Section 8. For additional requirements, refer to SH&E 402, *Excavation & Trenching*; SH&E 403, *Drilling*; and SH&E 310, *Overhead Electrical Lines*.

6.1.2 Manual Lifting

Most materials associated with investigation and remedial activities are moved by hand. The human body is subject to severe damage in the forms of back injury, muscle strains, and hernia if caution is not observed in the handling process. Whenever possible, use at least two people to lift, or roll/lift with your arms as close to the body as possible. Under no circumstances should any one person lift more than 49 pounds unassisted. For additional requirements, refer to SH&E 404, *Manual Materials Handling*.

6.1.3 Heavy Equipment and Vehicle Operations

Heavy equipment and site vehicles present serious hazards site personnel. Blind spots, failure to yield, and other situations may cause heavy equipment/vehicles to come into contact with personnel. To reduce the possibility of contact between equipment/traffic and personnel, always adhere to the following:

- Personnel must wear a high visibility, reflective safety vest at all times when working near heavy equipment and/or other vehicle traffic.
- Personnel must always yield to equipment/vehicle traffic and stay at least 100 feet away from all equipment/vehicle traffic. Always maintain eye contact with operators.
- When feasible, place barriers between work areas and equipment/vehicle traffic.
- Always ensure reverse warning alarms are working and louder than surrounding noise. Personnel must report inoperative reverse warning alarms.

For additional requirements, refer to SH&E 513, *Heavy Earth Working Equipment*.

6.1.4 Slips, Trips, Falls, and Protruding Objects

A variety of conditions may exist that may result in injury from slips, trips, falls, and protruding objects. Slips and trips may occur as a result of wet, slippery, or uneven walking surfaces. To prevent injuries from slips and trips, always keep work areas clean; keep walkways free of objects and debris; and report/clean up liquid spills. Serious injuries may occur as a result of falls from elevated heights. Always wear fall protection while working at heights of 6 feet or greater above the next lower level. Protruding objects are any object that extends into the path of travel or working area that may cause injury when contacted by personnel. Always be aware of protruding objects and when feasible remove or label the protruding object with an appropriate warning.

6.1.5 Electrical and Powered Equipment

Electrical and powered equipment may be used during a variety of site activities. Injuries associated with electrical and powered equipment include electric shock, cuts/lacerations, eye damage (from flying debris), and

burns. To reduce the potential of injury from the hazards associated with electrical and powered equipment, always comply with the following:

- Wear ANSI-approved (Z87.1) safety glasses. Faceshields may be required to provide additional face protection from flying debris.
- Wear appropriate work gloves. Work gloves may reduce the severity of burns and cuts/lacerations.
- Use ground fault circuit interrupters (GFCIs) when using electrical powered tools/equipment. GFCIs prevent electrical shock by detecting the loss of electricity from a power cord and/or electrical device.
- Use lockout/tagout procedures when performing maintenance or repairs on equipment.

6.1.6 Noise

Working around large equipment often creates excessive noise. The effects of noise can include physical damage to the ear, pain, and temporary and/or permanent hearing loss. Workers can also be startled, annoyed, or distracted by noise during critical activities.

Earth Tech has compiled noise monitoring data which indicates that work locations within 25 feet of operating heavy equipment (drill rigs, etc.) can result in exposure to hazardous levels of noise (levels greater than 90 dBA). Accordingly, all personnel are required to use hearing protection (ear plugs or ear muffs, minimum noise reduction rating of 25 dB) within 25 feet of any operating piece of heavy equipment.

Refer to SH&E 109, *Hearing Conservation Program* for requirements regarding hazardous noise and hearing protection.

6.1.7 Spill Prevention

Work activities may involve the use of hazardous materials (i.e. fuels, solvents) or work involving drums or other containers. The following procedures will be used to prevent or contain spills:

- All hazardous material will be stored in appropriate containers
- Tops/lids will be placed back on containers after use.
- Containers of hazardous materials will be stored appropriately away from moving equipment.

At least one spill response kit, to include an appropriate empty container, materials to allow for booming or diking the area to minimize the size of the spill, and appropriate clean-up material (i.e. speedy dri) shall be available at each work site (more as needed).

- All hazardous commodities in use (i.e. fuels) shall be properly labeled.
- Containers shall only be lifted using equipment specifically manufactured for that purpose.
- For drums/containers, follow the procedures in SH&E 405, *Handling of Drums and Large Containers*, to minimize spillage.

6.2 EXPOSURE MONITORING PROCEDURES

Monitoring procedures will be employed during site characterization activities to assess employee exposure to chemical and physical hazards. Monitoring will consist primarily of onsite determination of various parameters (e.g., airborne contaminant concentrations and heat stress effects), but may be supplemented by more sophisticated monitoring techniques, if necessary. Refer to SH&E 111, *Employee Exposure Monitoring* and SH&E 301, *Hazardous Waste Operations* for additional requirements.

6.2.1 Real-Time Exposure Measurement

Monitoring shall be performed within the work area on site in order to detect the presence and relative levels of toxic substances. The data collected throughout monitoring shall be used to determine the appropriate levels of PPE. Monitoring shall be conducted as specified in each THA (Attachment A) as work is performed.

Table 6-1specifies the real-time monitoring equipment which will be used for this project.

Table 6-1. Monitoring Parameters and Equipment

INSTRUMENT	MANUFACTURER/MODEL*	SUBSTANCES DETECTED
Photo Ionization Detector (PID)	RAE Systems ppb-RAE Photovac Microtip HNu Model Hnu (min. 10.2 eV bulb)	Petroleum hydrocarbons Organic Solvents
Multi or 4 Gas Detectors	RAE Systems Multi-RAE	Lower Explosive Limit Oxygen (O_2) Carbon Monoxide (CO) Hydrogen Sulfide (H_2S)
Particulate Monitor	MIE Model PDM-3 mini-RAM	Aerosols, mist, dust, and fumes

6.2.1.1 Health and Safety Action Levels

An action level is a point at which increased protection is required due to the concentration of contaminants in the work area or other environmental conditions. The concentration level (above background level) and the ability of the PPE to protect against that specific contaminant determine each action level. The action levels are based on concentrations in the breathing zone.

If ambient levels are measured which exceed the action levels in areas accessible to unprotected personnel, necessary control measures (barricades, warning signs, and mitigative actions, etc.) must be implemented prior to commencing activities at the specific work area.

Personnel should also be able to upgrade or downgrade their level of protection with the concurrence of SSO or the Safety Professional.

Reasons to upgrade:

- Known or suspected presence of dermal hazards.
- Occurrence or likely occurrence of gas, vapor, or dust emission.
- Change in work task that will increase the exposure or potential exposure to hazardous materials.

Reasons to downgrade:

- New information indicating that the situation is less hazardous than was originally suspected.
- Change in site conditions that decrease the potential hazard.
- Change in work task that will reduce exposure to hazardous materials.

Table 6-2. Monitoring Procedures and Action Levels

PARAMETER	LOCATION AND INTERVAL	RESPONSE LEVEL (Meter units/ppm above background)	RESPONSE
Hydrocarbons (Total by PID)*	Prior to initial entry in to impacted areas and then at least every 30 minutes afterwards in the worker's breathing zone or in the immediate work area. Confined spaces will require initial and continuous monitoring.	< 10	Level D work and continue monitoring (not applicable for initial assessment of unknown drums or containers.
		≥ 10 – 50 (Sustained for more than 5 minutes)	Contact the SSO, and if no potential for change in conditions exist (drum/container activities increasing airborne levels), don Level C (GMA/P100 cartridges or equivalent chemical cartridge combined with P100) and continue monitoring. Residents will be evacuated from the home.
		Initial entry into confined spaces if monitoring can not be performed from entry point	Level B ensemble as listed in SH&E 301, *Hazardous Waste Operations* and per SSO and SH&E Manager.
		≥ 50 (Sustained for more than 5 minutes)	
Dust, Mist, Aerosols (Total by Mini-Ram)*	Implement monitoring if dust control measures do not prevent dust from entering breathing zone, implement air monitoring and associated action responses.	Visible Dust	Implement dust control measures (water spray)
		< 0.5 mg/m^3 (Sustained for more than 5 minutes)	Continue Level D work and continue monitoring.
		≥ 0.5 mg/m^3 (Sustained for more than 5 minutes)	Upgrade to Level C PPE. Contact the PM and SSO, implement mitigation measures, and continue Level C (minimum GMA/P100 cartridges or equivalent chemical cartridge combined with P100) and continue monitoring.
		≥ 2 mg/m^3 (Sustained for more than 5 minutes)	Temporarily cease work operations, contact the PM and SH&E Manager to discuss improving site mitigation measures. Possible upgrade to Level B for exclusion zone workers.
Oxygen Levels (multi-gas detector or O_2 meter)	Prior to and continuously during entry into confined spaces (including excavations deeper than 4 feet).	19.5 – 23.5 percent (%) O_2	Continue work and monitoring. If significant changes exist in this acceptable range, contact the SSO to investigate the potential for contributing factors.
		< 19.5 or > 23.5 percent (%) O_2	Cease work, exit the work area or confined space and contact the SSO.
Carbon Monoxide	Prior to and continuously during entry into confined spaces (including excavations deeper than 4 feet).	< 25 ppm	Continue work and monitoring. If significant changes exist in this acceptable range, contact the SSO to investigate the potential for contributing factors.
		≥ 25 ppm	Cease work, exit the work area or confined space and contact the SSO.
Hydrogen Sulfide (multi-gas detector or individual H_2S meter)	Prior to and continuously during entry into confined spaces (including excavations deeper than 4 feet).	< 10 ppm	Continue work activities. If significant changes exist in this acceptable range, contact the SSO to investigate the potential for contributing factors.
		≥ 10 ppm	Cease work, exit the area or confined space, and contact the SSO.

Explosive Atmospheres (multi-gas detector or CGI)	Prior to and continuously during entry into confined spaces (including excavations deeper than 4 feet).	< 10% LEL	Continue work activities. If significant changes exist in this acceptable range, contact the SSO to investigate the potential for contributing factors.
		≥ 10% LEL	Cease work, exit the area or confined space, and contact the SSO.

6.2.1.2 Monitoring Equipment Calibration

All instruments used will be calibrated at the beginning and end of each work shift, in accordance with the manufacturer's recommendations. If the owner's manual is not available, the personnel operating the equipment will contact the applicable office representative, rental agency or manufacturer for technical guidance for proper calibration. If equipment cannot be pre-calibrated to specifications, site operations requiring monitoring for worker exposure or off-site migration of contaminants will be postponed or temporarily ceased until this requirement is completed.

6.2.1.3 Personal Sampling

Should site activities warrant performing personal sampling to better assess chemical exposures experienced by Earth Tech employees, the SSO, under the direction of a Certified Industrial Hygienist (CIH), will be responsible for specifying the monitoring required. Within five working days after the receipt of monitoring results, the CIH will notify each employee, in writing, of the results that represent that employee's exposure. Copies of air sampling results will be maintained in the project files.

Should the site activities warrant, the subcontractor will ensure its employees' exposures are quantified via the use of appropriate sampling techniques. The subcontractor shall notify the employees sampled in accordance with health and safety regulations, and provide the results to the SSO for use in determining the potential for other employees' exposure.

7.0 PERSONAL PROTECTIVE EQUIPMENT

7.1 PERSONAL PROTECTIVE EQUIPMENT

The purpose of personal protective equipment (PPE) is to provide a barrier, which will shield or isolate individuals from the chemical and/or physical hazards that may be encountered during work activities. SH&E 113, *Personal Protective Equipment*, lists the general requirements for selection and usage of PPE. Table 7-1 lists the minimum PPE required during site operations and additional PPE that may be necessary. The specific PPE requirements for each work task are specified in the individual THAs found in Attachment A.

By signing this HASP you are agreeing that you have been properly trained in the use, limitations, care and maintenance of the protective equipment you will use at this project. If you have not received training on the proper use, care, and limitations of the PPE required for this project, please see the PM/SSO for the proper training prior to signing this HASP.

Table 7-1. Personal Protective Equipment

TYPE	MATERIAL	ADDITIONAL INFORMATION
Minimum PPE:		
Safety Vest	High-visibility	Must have reflective tape and be visible from all sides
Boots	Leather	ANSI Z41 approved safety toe
Safety Glasses w/ sideshields		ANSI Z87.1 Approved
Hard Hat		ANSI Approved
Work Uniform		No shorts/cutoff jeans or sleeveless shirts
Additional PPE:		
Hearing Protection	Ear plugs and/ or muffs (minimum 29 NRR)	In hazardous noise areas
Work Gloves	Leather	If working with sharp objects or powered equipment.
Protective Chemical Gloves	Inner: Nitrile Outer: Heavy Duty Nitrile, Viton	
Protective Chemical Coveralls	Inner: Tyvek® or equivalent Outer: Tychem SL® or equivalent if splash hazard exists	
Protective Chemical Boots	Rubber	
Level C Respiratory Protection	MSA (Full Face or equivalent) equipped with GMA/P100	Cartridge change out schedule: At the end of each work shift.
Level B Respiratory Protection	Self Contained Breathing Apparatus (SCBA), Airline with 5 minute escape pack.	Grade "D" Certified Air (Certificate Required). Obtain certificate of analysis from compressed gas vendor.
Face Protection	Debris/splash shield	
Welding PPE	Leathers, appropriate lens	See SH&E 411 for specific PPE
Fall Protection	Approved harness w/ lanyard or equivalent if no railings are present.	Required when working at heights of 6 feet or greater.

7.2 DECONTAMINATION

All requirements for performing personal and equipment decontamination may be found in SH&E 604, *Decontamination*.

7.2.1 PPE Doffing and Donning Information

The following information is to provide field personnel with helpful hints that, when applied, make donning and doffing of PPE a more safe and manageable task:

- Never cut disposable booties from your feet with basic utility knives. This has resulted in workers cutting through the booty and the underlying sturdy leather work boot, resulting in significant cuts to the legs/ankles. Recommend using a pair of scissors or a package/letter opener (cut above and parallel with the work boot) to start a cut in the edge of the booty, then proceed by manually tearing the material down to the sole of the booty for easy removal.
- When applying duct tape to PPE interfaces (wrist, lower leg, around respirator, etc.) and zippers, leave approximately one inch at the end of the tape to fold over onto itself. This will make it much easier to remove the tape by providing a small handle to grab while still wearing gloves. Without this fold, trying to pull up the tape end with multiple gloves on may be difficult and result in premature tearing of the PPE.
- Have a "buddy" check your ensemble to ensure proper donning before entering controlled work areas. Without mirrors, the most obvious discrepancies can go unnoticed and may result in a potential exposure situation.
- Never perform personal decontamination with a pressure washer.

7.2.2 Disposal of PPE & Decontamination Materials

All PPE and decontamination materials (i.e., rinsate, tubs, brushes, etc.) must be disposed of in accordance with federal, state, and local regulations. Contaminated PPE and decontamination materials may need to be disposed of as hazardous waste based on the types and degree of contamination.

8.0 SITE CONTROL

8.1 GENERAL

The purpose of site control is to minimize potential contamination of workers, protect the public from site hazards, and prevent vandalism. The degree of site control necessary depends on the site characteristics, site size, and the surrounding community.

Controlled work areas will be established at each work location, and if required, will be established directly prior to the work being conducted. Diagrams designating specific controlled work areas will be drawn on site maps, posted in the support vehicle or trailer and discussed during the daily safety meetings. If the site layout changes, the new areas and their potential hazards will be discussed immediately after the changes are made. A general example of a zone layout has been developed for site activities and is attached to this section.

8.2 CONTROLLED WORK AREAS

Each HAZWOPER controlled work area will consist of the following three zones:

- Exclusion Zone: Contaminated work area.
- Contamination Reduction Zone: Decontamination area.
- Support Zone: Uncontaminated or "clean area" where personnel should not be exposed to hazardous conditions.

Each zone will be periodically monitored in accordance with the air monitoring requirements established in this HASP. The Exclusion Zone and the Contamination Reduction Zone are considered work areas. The Support Zone is accessible to the public (e.g., vendors, inspectors).

8.2.1 Exclusion Zone

The Exclusion Zone is the area where primary activities occur, such as sampling, remediation operations, installation of wells, cleanup work, etc. This area must be clearly marked with hazard tape, barricades or cones, or enclosed by fences or ropes. Only personnel involved in work activities, and meeting the requirements specified in the applicable THA and Sections 4.1 and 4.2, will be allowed in an Exclusion Zone.

The extent of each area will be sufficient to ensure that personnel located at/beyond its boundaries will not be affected in any substantial way by hazards associated with sample collection activities. To meet this requirement, the site supervisor will establish daily work zones sufficient to protect site personnel and the public.

All personnel should be alert to prevent unauthorized, accidental entrance into controlled-access areas (the *Exclusion Zone and CRZ). If such an entry should occur, the trespasser should be immediately escorted outside* the area, or all HAZWOPER-related work must cease. All personnel, equipment, and supplies that enter controlled-access areas must be decontaminated or containerized as waste prior to leaving (through the CRZ only).

8.2.2 Contamination Reduction Zone

The Contamination Reduction Zone is the transition area between the contaminated area and the clean area. Decontamination is the main focus in this area. The decontamination of workers and equipment limits the physical transfer of hazardous substances into the clean area. This area must also be clearly marked with hazard tape and access limited to personnel involved in decontamination. Decontamination procedures are further explained in SH&E 604.

8.2.3 Support Zone

The Support Zone is an uncontaminated zone where administrative and other support functions, such as first aid, equipment supply, emergency information, etc., are located. The Support Zone shall have minimal potential for significant exposure to contaminants (i.e., background levels).

Employees will establish a Support Zone (if necessary) at the site before the commencement of site activities. The Support Zone would also serve as the entry point for controlling site access.

8.3 SITE ACCESS DOCUMENTATION

All personnel entering the site shall complete the "Site Entry/Exit Log" located at the Command Post.

If implemented by the PM, all personnel required to enter established site control zones shall complete the Exclusion and/or "Hot Zone" Log located at the decontamination area.

8.3.1 Visitor Access

Visitors to any HAZWOPER controlled-work area must comply with the health and safety requirements of this HASP, and demonstrate an acceptable need for entry into the work area. All visitors desiring to enter any controlled work area must observe the following procedures:

1. A written confirmation must be received by Earth Tech documenting that each of the visitors has received the proper training and medical monitoring required by this HASP. Verbal confirmation can be considered acceptable provided such confirmation is made by an officer or other authorized representative of the visitor's organization.
2. Each visitor will be briefed on the hazards associated with the site activities being performed and acknowledge receipt of this briefing by signing the appropriate tailgate safety briefing form.
3. All visitors must be escorted by the PM or designee.

If the site visitor requires entry to any Exclusion Zone, but does not comply with the above requirements, all work activities within the Exclusion Zone must be suspended. Until these requirements have been met, entry will not be permitted.

8.4 SITE SECURITY

Site security is necessary to:

- Prevent the exposure of unauthorized, unprotected people to site hazards.
- Avoid the increased hazards from vandals or persons seeking to abandon other wastes on the site.
- Prevent theft.
- Avoid interference with safe working procedures.

To maintain site security during working hours:

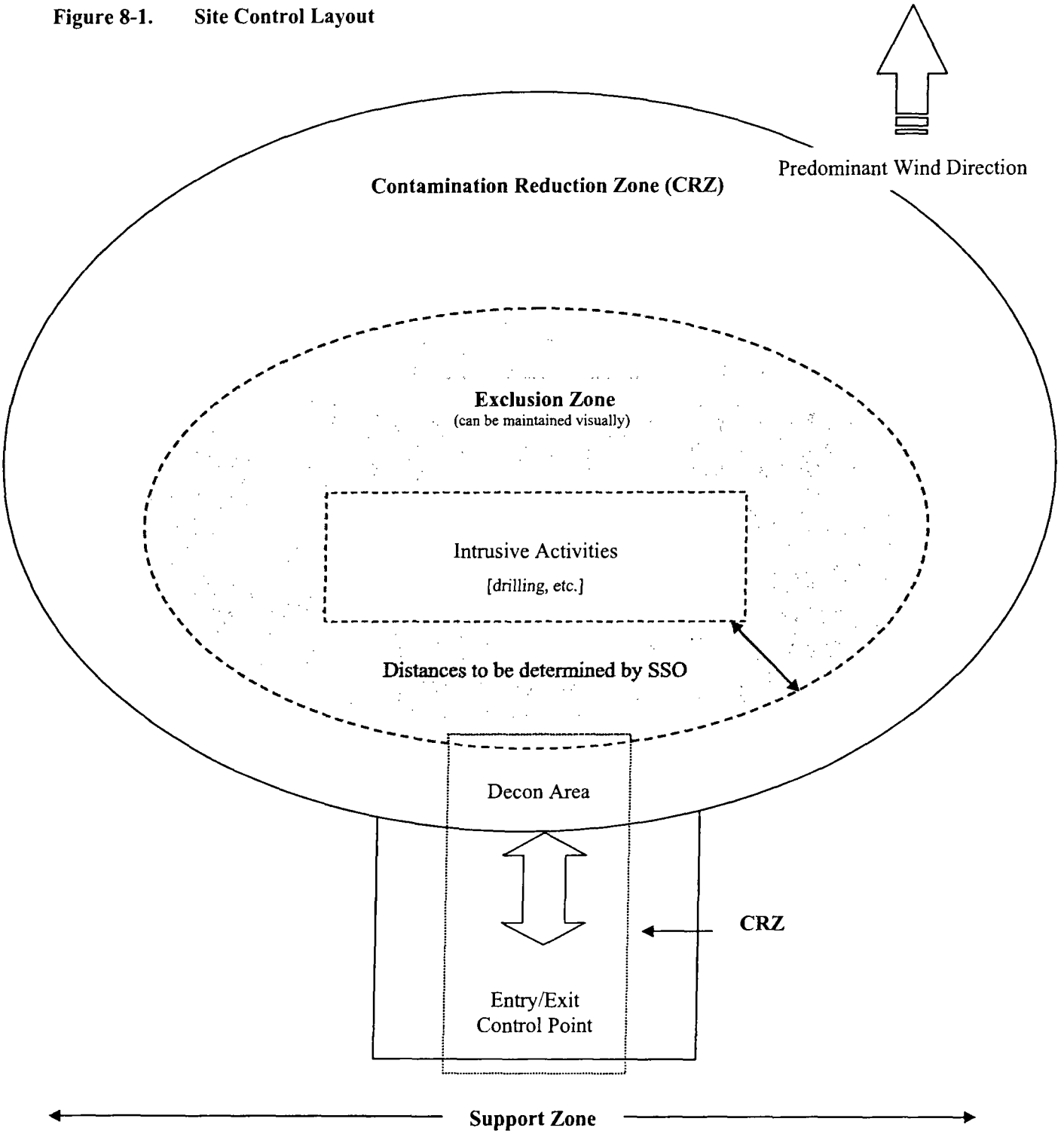
1. Maintain security in the Support Zone and at access control points.
2. Establish an identification system to identify authorized persons and limitations to their approved activities.
3. Assign responsibility for enforcing authority for entry and exit requirements.
4. When feasible, install fencing or other physical barrier around the site.
5. If the site is not fenced, post signs around the perimeter and whenever possible, use guards to patrol the perimeter. Guards must be fully apprised of the hazards involved and trained in emergency procedures.
6. Have the PM approve all visitors to the site. Make sure they have valid purpose for entering the site. Have trained site personnel accompany visitors at all times and provide them with the appropriate protective equipment.

To maintain site security during off-duty hours:

1. If possible, assign trained, in-house technicians for site surveillance. They will be familiar with the site, the nature of the work, the site's hazards, and respiratory protection techniques.

2. If necessary, use security guards to patrol the site boundary. Such personnel may be less expensive than trained technicians, but will be more difficult to train in safety procedures and will be less confident in reacting to problems around hazardous substances.
3. Enlist public enforcement agencies, such as the local police department, if the site presents a significant risk to local health and safety.
4. Secure the equipment.

Figure 8-1. Site Control Layout



9.0 EMERGENCY CONTINGENCY PLAN

Emergencies are uncontrolled circumstances that can result in damage to personnel or property. Emergencies can be a result of the work process (e.g., hazardous material spills), or environmental conditions, such as severe weather. Once identified, response to emergencies typically occurs in three stages: communication, evacuation, and mitigation (response or control method). In addition, the emergency response procedures will vary with each situation. Table 9-2 at the end of this plan serves as a guideline for responding to emergencies at the Behr VOC Plume Site.

Prior to initiating field activities, a meeting will be held with local fire department and emergency management system (EMS) personnel to communicate the scope of work at the Behr VOC Plume Site.

9.1 COMMUNICATION PROCEDURES

Communication procedures consist of the verbal, audio, and visual methods of notifying the appropriate personnel of an emergency, as well as the necessary protocols for notification. The communication of an emergency consists of three (3) phases:

1. Initial communication:
   The individual(s) who identify an emergency must immediately notify the Emergency Coordinator (EC). If necessary, the individual(s) may contact emergency services (e.g., 911) and/or order an evacuation of the work area prior to contacting the EC.
2. Evacuation:
   If necessary, the EC will notify all personnel to evacuate the work area and proceed to the appropriate muster location(s). Additional notifications will be made to subcontractors, other employers, the client, and public if necessary. See Section 1.2 below.
3. Mitigation/Control Measures:
   The EC will communicate any necessary measures to control or reduce the potential impact of the emergency to employees or emergency units. See Section 1.3 below.

Prior to performing any site activities, emergency communication and alarm methods must be developed (see Table 9-2) and communicated to ensure all site personnel are knowledgeable of protocol. When developing the alarm methods, consideration must also be given as to how the employees who hear/see the alarm will respond. For example, some alarms consist of a long, steady whistle to signify a fire, whereas two short alarm bursts, followed by a pause, followed by two short bursts, can signify that equipment shall be shut down and all personnel shall immediately proceed to the muster location(s).

In addition, personnel must be able to contact the EC and/or outside emergency units as needed. Therefore, mobile communication systems (e.g., radio, cell phone, horn, etc.) must be available to employees in the work zone. Emergency numbers are listed in Table 9-1 and must be posted at all exits of the site/project office and in all site vehicles.

Earth Tech Corporate Incident Reporting Procedures

All accidents, incidents, near-misses, and emergency situations that occur on-site during any field activity will be promptly reported to the SSO and the PM in accordance with Earth Tech Safety Procedure SH&E 101, *Injury, Illness, and Near-Miss Reporting.*

If any Earth Tech employee is injured and requires medical treatment, the PM will contact **Earth Tech's Incident Reporting Line at (800) 348-5046 immediately**. The PM will initiate a written report, using the ***Supervisor's Report of Incident*** form (see SH&E 101). The PM will complete the form and forward to the Section Manager and Corporate Safety Administrator by the following work day.

If any employee of a subcontractor is injured, documentation of the incident will be accomplished in accordance with the subcontractor's procedures; however, copies of all documentation (which at a minimum must include the OSHA Form 301 or equivalent) must be provided to the SSO within 24 hours after the accident has occurred.

9.2 EVACUATION PROCEDURES

Evacuation of the work zone and other areas will be required if it is determined that an emergency may result in injury or illness to personnel. Specific examples include large fire/explosion, chemical spill or release, severe weather event, and security threats. The EC will determine if an evacuation is necessary based on the severity of the emergency. However, any person may order an evacuation or sound an evacuation alarm to protect the safety of site personnel.

Upon the issuance of an evacuation order or alarm, personnel must evacuate the work zone and proceed directly to the appropriate muster location(s). Muster locations must be of sufficient distance from the emergency location and/or of sufficient structure and stability to protect personnel from the hazards.

Prior to beginning site operations, the EC will identify the appropriate emergency routes and muster locations in Table 9-2. If necessary, the EC may develop evacuation routes and muster locations for various buildings or sections of the site. In addition, the EC may and is encouraged to use site specific maps to identify the appropriate evacuation routes and muster locations. Emergency routes must be posted in the appropriate work areas and communicated to personnel.

In the event that an evacuation is ordered, the following general requirements apply:

- Work activities will cease and all personnel will be evacuated from the work location. The evacuation will proceed in a direction opposite the critically affected area, with all personnel assembling in a pre-designated location outside of the site.
- A headcount will be taken of the assembled employees by the EC.
- In the event that outside response agencies must respond, an individual will be identified to meet emergency responders at the site entrance or pre-determined location.

9.3 MITIGATION & CONTROL MEASURES

The implementation of mitigation and control measures are designed to reduce and/or eliminate the potential effects of emergencies. Known control measures for emergencies will be listed in Table 9-2.

9.4 RESPONSIBILITIES & TRAINING

9.4.1 Emergency Coordinator

The RM will assume the duties of the emergency coordinator (EC). In addition, the RM will select a competent person to act as the alternate EC. The duties of the EC and the alternate EC have been specified in SH&E 205 and are listed below:

- Responsible for the completing the emergency information (e.g., signals, muster points, etc.) located in Table 9-2 *Emergency Procedures* prior to beginning site activities and updating as needed. Table 9-2 must be posted in prominent locations on site.
- Responsible for directing all actions in emergency situations, until relieved by outside emergency response units (i.e., Fire Department).
- Responsible for ensuring all Earth Tech employees on site are trained in the provisions of this plan, and the required actions.
- Designates specific communication procedures to ensure that all personnel are alerted to potential emergency conditions, and what actions are required.
- Continually reviews this plan to ensure that identified hazards and actions are adequate for the office and/or facility.
- Designates personnel to perform specific duties during emergencies, such as taking muster, and directing emergency responders to the site(s).
- Responsible for ensuring that other contractors at the office are notified as to the potential emergencies associated with Earth Tech work, and that the contractors provide information as to potential emergencies associated with their work processes. Also, ensures that the contractor's hazards and emergency warning systems are communicated to Earth Tech employees.

- Ensures that all hazard signs (e.g., exit signs) and floor plans are posted as required. Ensures that emergency exit doors are not blocked, are labeled, and are not locked at any time.
- Establishes criteria and scheduling of emergency drills for Earth Tech employees. Critiques the drill results, and works with the supervisors to correct any observed deficiencies.
- Ensures that new employees are trained on the provisions of this plan prior to entering the work site. Ensures that visitors are either trained on the provisions of this plan, or are continually escorted by a trained employee.

9.4.2 Site Personnel

- Ensure compliance with all provisions of this plan.
- Alert the Emergency Coordinator/Supervisor to any observed conditions that can create an emergency situation.
- Notify the Emergency Coordinator/Supervisor of any change in work conditions that may impact the identified hazards in this plan.
- Do not block emergency exits or accesses.
- Participate in drills that are conducted to ensure the adequacy of the plan.

9.4.3 Subcontractors, Visitors, and Client Personnel

Subcontractors, visitors, and client personnel will follow the emergency action plans of their respective employers for the operations being performed.

Table 9-1. Emergency Contacts

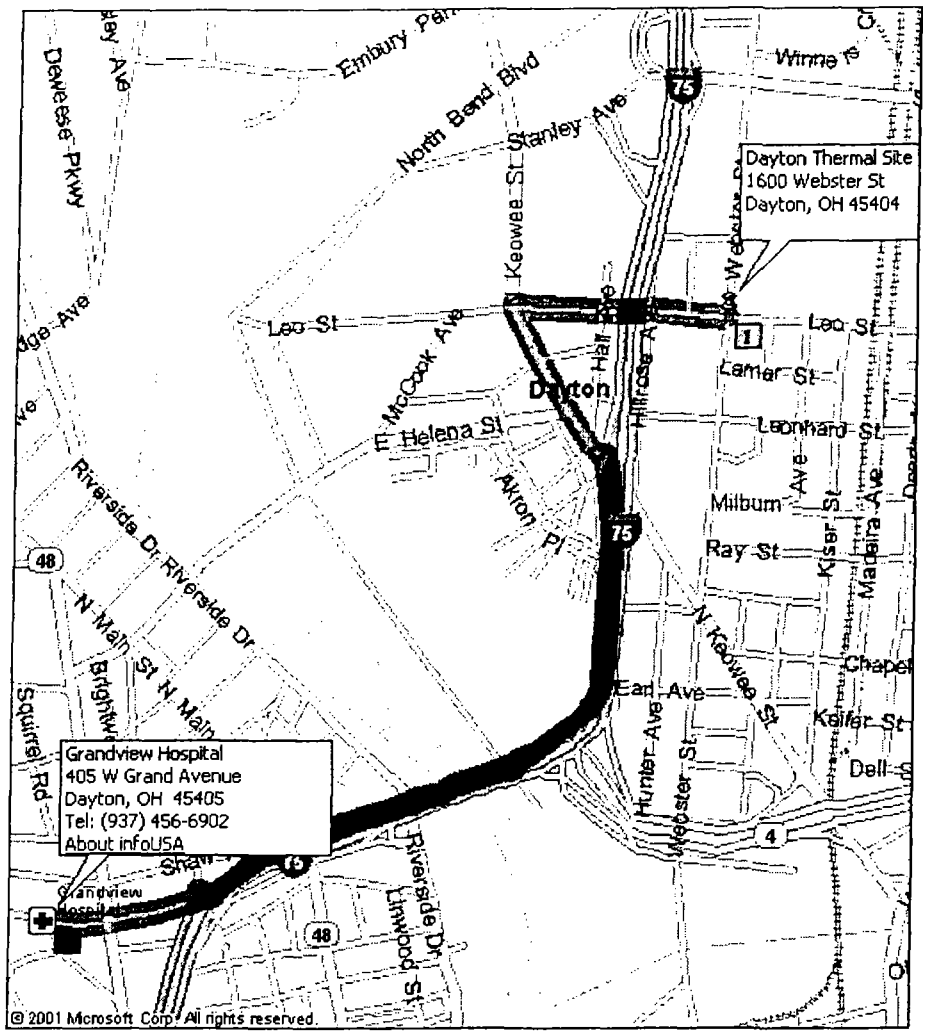
Emergency Coordinators / Key Personnel			
Name	**Title/Workstation**	**Telephone Number**	**Cellular Phone**
Gary Stanczuk	Client Contact	248-576-7365	
Justin Kelley	Project Manager	734-779-0364	248-249-4370
Scott Stacy	Supervisor/SSO/EC	734-779-2819	734-564-2547
Chad Ross	Safety Manager	859-442-2300	859-512-7774
Travis Westra	Safety Professional	616-975-4620	616-285-0243
Steve Renninger	U.S. EPA OSC	513-260-7849	
John Sherrard	Dynamac	513-703-3092	
Incident Reporting	**Corporate Safety Administrator**	**800-348-5046**	

Organization / Agency	
Name	**Telephone Number**
Police Department	911 or 937-225-4357
Fire Department	911 or 937-333-4500
State Police	911 or 937-832-8794
Ambulance Service ***(EMT will determine appropriate hospital for treatment)***	911 or 937-225-4357
Poison Control Center	800-222-1222
Pollution Emergency	800-292-4706
National Response Center	800-424-8802
Chem-Trec	800-424-9300
Title 3 Hotline	800-424-9346

Hospital	
Grandview Hospital ***(Use by site personnel is only for non-emergency cases)***	937-226-3200
405 W Grand Avenue	
Dayton, Ohio 45405 (Hospital Route Maps on following page)	
Hospital Route: Depart Dayton Thermal Site on Leo St (West) for 0.3 mi. Turn LEFT (South) onto N Keowee St for 0.3 mi. Bear RIGHT (South) onto Ramp for 174 yds. Merge onto I-75 (South) for 0.8 mi. Turn off onto Ramp for 0.2 mi. Turn LEFT (South) onto W Great Miami Blvd for 21 yds. Turn RIGHT (West) onto W Grand Ave for 0.2 mi. Arrive Grandview Hospital	

Public Utilities	
Name	**Telephone Number**
OUPS	800-362-2764

Figure 9-1. Hospital Route/Detail Maps



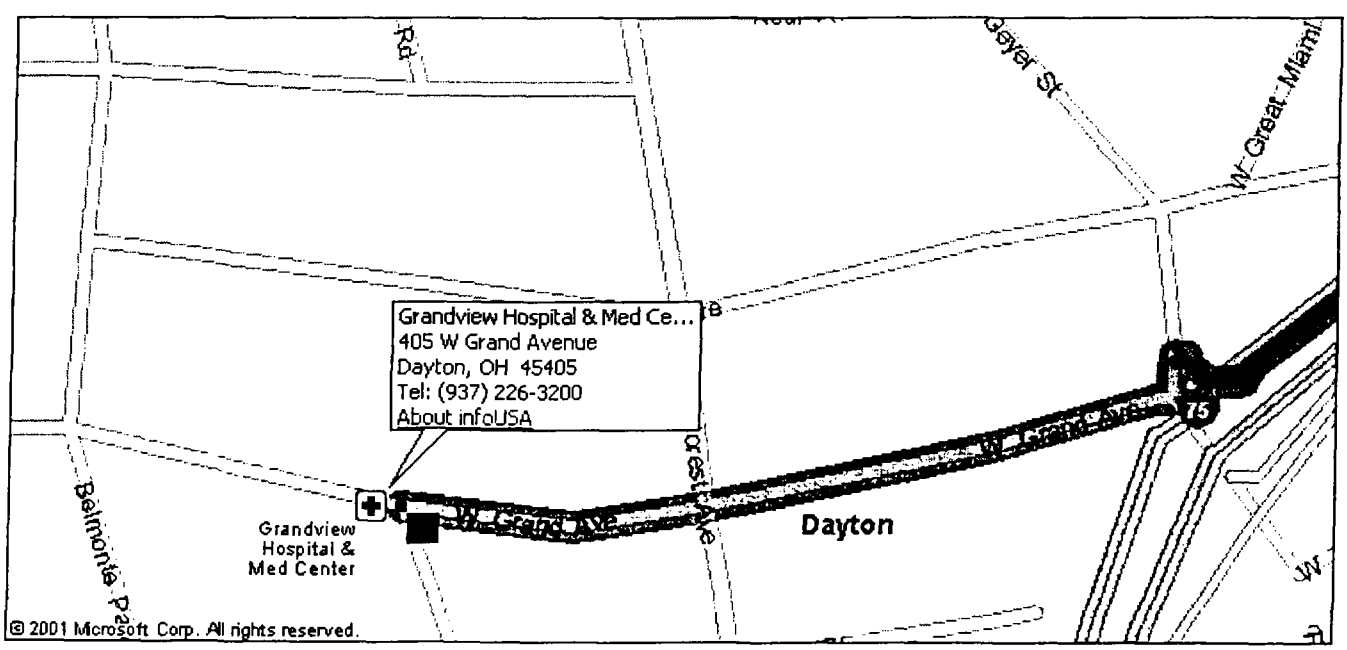


Table 9-2. Emergency Procedures

EMERGENCY	RESPONSE PROCEDURES		
	Communication	**Mitigation/Control**	**Evacuation**
Medical Emergency	If life-threatening, **contact 911** immediately and notify site supervisor.	If qualified, perform First Aid-CPR. Keep victim calm and watch for symptoms of shock. Emergency response personnel will transport victims to hospital.	Do not move victim unless imminent threat (e.g., fire, explosion, chemical exposure, etc.) is present.
Chemical Exposure	Report incident to site supervisor immediately.	Refer to chemical safety card or MSDS for appropriate treatment measures.	Remove individual from danger area.
Other Incident/Near Miss	Report incident to site supervisor immediately. Site supervisor will contact safety department.	For non-life threatening injuries or illness, transport victim to the hospital listed in Figure 9-1.	None anticipated
Severe Weather	Site supervisor will notify personnel via radio when severe weather is approaching or use the following signal:	Allow sufficient time for decontamination and shut down of operations.	**If severe weather is imminent, evacuate to the following shelter(s):**
Tornado	Site supervisor will notify foreman via radio if severe weather may result in tornado activity **or use the following signal:**	Allow sufficient time for decontamination and shut down of operations.	**Tornado shelter location(s):**
Small Fire* **** Less than the size of a small trash can.***	Notify site supervisor to **contact 911** immediately. **Notify all personnel evacuate or use the following signal:**	Determine if fire can be safely contained with a fire extinguisher.	See evacuation route map(s). **Exit facility and muster at the following location(s):**
Large Fire/Explosion	Notify site supervisor to **contact 911** immediately. **Notify all personnel to evacuate or use the following signal:**	None anticipated. Evacuate immediately.	See evacuation route map(s). **Exit facility and muster at the following location(s):**
Spills/Release	Notify site supervisor. Site supervisor will contact OSC and determine if additional agencies must be notified.	Contact safety department. Use spill kit and diking procedures to contain spill.	See evacuation route map(s). Exit facility and move upwind at least 1000 feet.
Security Threat	Notify site supervisor. **Contact 911.**	Keep vehicles locked and valuables out of sight.	None anticipated.
Confined Space Emergency	See Permit.	See Permit.	See Permit.

10.0 PERSONNEL ACKNOWLEDGEMENT

By signing below, the undersigned acknowledges that he/she has read and reviewed the Earth Tech Health and Safety Plan for the Behr VOC Plume Site. The undersigned also acknowledges that he/she has been instructed in the contents of this document and understands the information pertaining to the specified work, and will comply with the provisions contained therein.

PRINT NAME	SIGNATURE	ORGANIZATION	DATE

Attachment A

Task Hazard Analyses

EARTH TECH
A tyco INTERNATIONAL LTD COMPANY

TASK HAZARD ANALYSIS (THA)
DAYTON THERMAL PRODUCTS SITE
DAYTON, OHIO

Evaluated by: Ryan Wolschleger, ASP, OHST

Date: November 2006

TASK NAME

SUBCONTRACTOR OVERSIGHT

TASK DESCRIPTION	CHEMICAL EXPOSURE HAZARDS
This task will involve oversight of subcontractor activities to include the installation of sub-slab depressurization systems in residential homes.	• See Section 5 of the Master HASP • Chlorinated solvents • PCBs • Petroleum products

PPE	OTHER SAFETY EQUIPMENT	PHYSICAL HAZARDS
Level D (downgrade/upgrade based on monitoring results and Safety Professional approval) • High-visibility reflective safety vest • ANSI approved hardhat. • ANSI approved safety glasses. • ANSI approved steel toe safety shoes/boots.	• Air Purifying Respirator with GMA/P100 cartridge if necessary • Protective chemical gloves (inner & outer), coveralls (tyvek®), and rubber boots/booties if entering impacted areas • Fire extinguisher • First aid supplies	• Subcontractor hazards • Cuts/lacerations (handling of sharp objects, operating powered tools/equipment, etc.) • Heavy lifting (objects over 49 pounds) • Equipment traffic (street traffic, etc.) • Slips/trips/falls/protruding objects

APPLICABLE OPERATIONAL SAFETY PROCEDURES	ADDITIONAL SAFETY CONSIDERATIONS
• SH&E 201, General Safety Rules • SH&E 207, Contractor and Subcontractor SH&E Requirements	1. Pre-qualify subcontractors in accordance with SH&E 207. Contact District Safety Manager for additional information. 2. Coordinate activities with subcontractors prior to entering active work zones. Have subcontractor's SSO/supervisor brief Earth Tech personnel on hazards prior to entry into active work zones. 3. Do not perform subcontractor activities without development of a THA.

MONITORING PROCEDURES

Monitoring in accordance with requirement of Section 6 in Master HASP.

EARTH TECH
A tyco INTERNATIONAL LTD COMPANY

TASK HAZARD ANALYSIS (THA)
DAYTON THERMAL PRODUCTS SITE
DAYTON, OHIO

Evaluated by: Ryan Wolschleger, ASP, OHST

Date: November 2006

TASK NAME

MOBILIZATION / DEMOBILIZATION / SITE SET UP

TASK DESCRIPTION

This task hazard analysis refers to the process of mobilizing and demobilizing the people and the materials to complete the tasks outlined in the HASP/work plan. This applies primarily to moving/loading/unloading of equipment and materials and the set up of office trailers and work zones. This THA does not cover the actual hazards present within the exclusion zone and work areas. This THA does apply whenever new materials are brought to the site or removed from the site.

This THA also involves basic site set up activities such as decontamination construction, debris clean up, etc.

CHEMICAL EXPOSURE HAZARDS

- None anticipated

PPE

Level D

- High-visibility reflective safety vest
- ANSI approved hardhat.
- ANSI approved safety glasses.
- ANSI approved steel toe safety shoes/boots.

OTHER SAFETY EQUIPMENT

- Leather gloves when handling sharp object or operating powered equipment
- Hearing protection (minimum 29 NRR)
- Fall protection (contact Safety Professional)
- Flashlights
- First aid kit
- Fire extinguisher

PHYSICAL HAZARDS

- Cuts/lacerations (handling of sharp objects, etc.)
- Heavy lifting (objects over 49 pounds)
- Equipment traffic (bobcat, forklift, street traffic, etc.)
- Slips/trips/falls
- Protruding/sharp objects
- Heat/cold stress
- Hazardous noise levels
- Falls/elevated heights (6 feet or more above next lower level, site trailer set-up, etc.)
- Inadequate lighting
- Utilities (overhead electrical, etc.)

APPLICABLE OPERATIONAL SAFETY PROCEDURES

- SH&E 201, General Safety Rules
- SH&E 210, Walking/Working Surfaces Protection
- SH&E 310, Overhead Electrical Lines
- SH&E 404, Manual Materials Handling
- SH&E 505, Powered Hand Tools
- SH&E 506, Manual Hand Tools
- SH&E 601, Hazardous Materials Shipping

ADDITIONAL SAFETY CONSIDERATIONS

1. Locate powerlines on site prior to beginning operations. If work will occur within 50 feet of powerlines, refer to SH&E 310 for protection requirements.
2. All loads in excess of 49 pounds require use of mechanical aids or assistance from other personnel.
3. Use spotters when loading/unloading heavy equipment, forklifts, etc. Stand clear of these operations.
4. Do not enter tank, vats, sumps, holes, or other potential confined spaces without a Confined Space Entry Procedure, Hazard Evaluation, and Permit completed.
5. Ensure all equipment and chemicals are suitable for transportation – Hazmat shipping has been adhered to (Check with the T&D department if you are unsure).
6. Ensure that equipment, materials, chemicals, etc. have been secured for transportation
7. DO NOT overload trucks, trailers, etc. If more room is needed, or loads are to large, obtain additional transportation resources.

MONITORING PROCEDURES

Monitoring is not anticipated for this task.

EARTH TECH
A tyco INTERNATIONAL LTD COMPANY

TASK HAZARD ANALYSIS (THA)
DAYTON THERMAL PRODUCTS SITE
DAYTON, OHIO

Evaluated by: Ryan Wolschleger, ASP, OHST

Date: November 2006

TASK NAME

SUB-SLAB VAPOR PROBE INSTALLATION

TASK DESCRIPTION	CHEMICAL EXPOSURE HAZARDS
This task hazard analysis refers to the process of installation of sub-slab vapor probes as part of the tasks outlined in the site work plan. This applies primarily to drilling through concrete, installing a stainless steel probe, and patching the concrete. This THA covers drilling and concrete installation activities. Basic site set up activities such as decontamination construction, debris clean up, etc. are covered in the mobilization / demobilization / site set up THA.	• None anticipated

PPE	OTHER SAFETY EQUIPMENT	PHYSICAL HAZARDS
Level D • High-visibility reflective safety vest • ANSI approved hardhat. • ANSI approved safety glasses. • ANSI approved steel toe safety shoes/boots.	• Leather gloves when handling sharp object or operating powered equipment • Hearing protection (minimum 29 NRR) • Flashlights • First aid kit • Fire extinguisher	• Cuts/lacerations (handling of sharp objects, etc.) • Heavy lifting (objects over 49 pounds) • Equipment traffic (bobcat, forklift, street traffic, etc.) • Slips/trips/falls • Protruding/sharp objects • Heat/cold stress • Hazardous noise levels • Falls/elevated heights (6 feet or more above next lower level, site trailer set-up, etc.) • Inadequate lighting • Utilities (overhead electrical, etc.)

APPLICABLE OPERATIONAL SAFETY PROCEDURES	ADDITIONAL SAFETY CONSIDERATIONS
• SH&E 201, General Safety Rules • SH&E 210, Walking/Working Surfaces Protection • SH&E 404, Manual Materials Handling • SH&E 505, Powered Hand Tools • SH&E 506, Manual Hand Tools • SH&E 601, Hazardous Materials Shipping	1. Use spotters when loading/unloading heavy equipment, forklifts, etc. Stand clear of these operations. 2. Ensure all equipment and chemicals are suitable for transportation – Hazmat shipping has been adhered to (Check with the T&D department if you are unsure). 3. Ensure that equipment, materials, chemicals, etc. have been secured for transportation 4. DO NOT overload trucks, trailers, etc. If more room is needed, or loads are to large, obtain additional transportation resources.

MONITORING PROCEDURES

Monitoring is not anticipated for this task.

Attachment B

Material Safety Data Sheets

Material Data Safety Sheet

For Coatings, Resins and Related Materials

SECTION I - PRODUCT IDENTIFICATION

Manufacturer: Van Aken International
9157 Rochester Court
P.O. Box 1680
Rancho Cucamonga, CA 91729-1680

Information Phone: 909.980.2001
Emergency Phone: 909.980.2001

Product Class: Proprietary Mixture
Trade Name: Modeling Clay (Plastelene)
Product Code: 10000 Series

SECTION II - HAZARDOUS INGREDIENTS

This product is certified by an authority on toxicology associated with a leading university to contain no materials in sufficient quantities to be toxic or injurious to the human body, even if ingested.

ACMI approved
Conforms to
ASTM D-4236.

SECTION III - PHYSICAL DATA

Boiling Range:N/A
Evaporation Range: Slower than ether.
Volatiles Volume: Negligible
Appearance: Pigmented solid clay with negligible odor.
Vapor Density: Heavier than air.
Specific Gravity: N/A

SECTION IV - FIRE AND EXPLOSION HAZARD DATA

Flammability Class: N/A
Extinguishable Media: Water, Foam, Carbon Dioxide, or Dry Chemical
Special Fire Fighting Procedures: Use air-supplied rescue equipment for enclosed areas. Cool exposed container with water.
Unusual Fire and Explosion Hazards: None

Flash Point: 415

SECTION V - HEALTH HAZARD DATA

Threshold Limit Value: N/A
Effects of Overexposure: None known.

First Aid:
- **Ingestion:** No first aid is normally required; however, if swallowed and symptoms develop, seek medical attention.
- **Eye Contact:** Flush with cold water, if irritation persists, seek medical attention.
- **Skin Contact:** Wash with soap and warm water.
- **Inhalation:** Remove to fresh air.

SECTION VI - REACTIVITY DATA

Stability: Stable
Hazardous Polymerization: Will not occur.
Incompatibility: Avoid contact with strong oxidizing agents.
Conditions to Avoid: Extreme heat.

SECTION VII - SPILL OR LEAK PROCEDURES

Steps to be taken in case material is released or spilled: Normal solids clean up.
Waste Disposal Method: In accordance with local, county, state, and federal regulations.

SECTION VIII - SPECIAL PROTECTION INFORMATION

Respiratory Protection: Not normally needed.
Ventilation: Not normally needed.
Protective Gloves: Not normally needed.
Eye Protection: Not normally needed.

SECTION IX - SPECIAL PRECAUTIONS

Precautions to be taken in handling and storing: Keep from heat and open flame.
Other Precautions: None

DISCLAIMER OF EXPRESSED AND IMPLIED WARRANTIES

The information in this document is believed to be correct as of the date issued.
HOWEVER, NO WARRANTY OF MERCHANTABILITY, FITNESS FOR ANY PARTICULAR PURPOSE, OR ANY OTHER WARRANTY IS EXRESSED OR IS IMPLIED REGARDING THE ACCURACY OR COMPLETENESS OF THIS

INFORMATION, THE RESULTS TO BE OBTAINED FROM THE USE OF THE PRODUCT, THE SAFETY OF THIS PRODUCT, OR THE HAZARDS RELATED TO ITS USE. This information and product are furnished on the conditions that the person receiving them shall make his own determination as to the suitability of the product for his particular purpose and on the condition that he assume the risk of his use thereof.

Material Safety Data Sheet
[OSHA 29 CFR 1910.1200]

The QUIKRETE® Companies
One Securities Centre
3490 Piedmont Road, Suite 1300
Atlanta, GA 30329

Emergency Telephone Number
(770) 216-9580

Information Telephone Number
(770) 216-9580

Revision: October 2005

MSDS K

SECTION I: PRODUCT IDENTIFICATION

Product Types: QUIKRETE® DRY PACKAGED PORTLAND CEMENT BASED PRODUCTS (SERIES 5)

QUIKRETE® Product Name	Code #	QUIKRETE® Product Name	Code #
QUIKRETE® PORTLAND CEMENT	1124	QUIKRETE® MASONRY CEMENT	1125-70
QUIKRETE® PORTLAND/LIME	1124-06	PORTLAND/POZZOLAN CEMENT	1118-35
CEMENT	1125-21	GROUT-TYPE A	1585-04
PLASTIC CEMENT	2121		

(ALSO APPLIES TO OTHER SPECIALTY PORTLAND OR MASONRY CEMENTS)

SECTION II - HAZARDOUS INGREDIENTS/IDENTITY INFORMATION

Hazardous Components	CAS No.	PEL (OSHA) mg/M^3	TLV (ACGIH) mg/M^3
Portland Cement	65997-15-1	5	5
May contain:			
Silica Sand, crystalline	14808-60-7	$\frac{10}{\%SiO_2+2}$	0.05 (respirable)
Pulverized Limestone	01317-65-3	5	5
Fly Ash	68131-74-8	5	5
Gypsum	10101-41-4	5	5
Lime	01305-62-0	5	5

Although these products contain no intentionally added Silica, they may contain small amounts of silica occurring as natural impurities in the other raw materials.

Other Limits: National Institute for Occupational Safety and Health (NIOSH). Recommended standard maximum permissible concentration=0.05 mg/M^3 (respirable free silica) as determined by a full-shift sample up to 10-hour working day, 40-hour work week. See NIOSH Criteria for a Recommended Standard Occupational Exposure to Crystalline Silica.

SECTION III - PHYSICAL/CHEMICAL CHARACTERISTICS

Appearance: Gray to gray-brown colored powder. Some products available in white and other colors.

Specific Gravity:	2.6 to 3.15	**Melting Point:**	>2700°F	**Boiling Point:**	>2700°F
Vapor Pressure:	None	**Vapor Density:**	None	**Evaporation Rate:**	None
Solubility in Water:	Slight	**Odor:**	None		

SECTION IV - FIRE AND EXPLOSION HAZARD DATA

Flammability: Noncombustible and not explosive.

SECTION V - REACTIVITY DATA

Stability: Stable.
Incompatibility (Materials to Avoid): Material when mixed with water will react with Aluminum and other alkali and alkaline earth elements liberating hydrogen gas.
Hazardous Decomposition or By-products: None
Hazardous Polymerization: Will Not Occur.
Condition to Avoid: Keep dry until used to preserve product utility.

SECTION VI - HEALTH HAZARD DATA

Route(s) of Entry: Inhalation, Skin, Ingestion
Acute Exposure: Product becomes alkaline when exposed to moisture. Exposure can dry the skin, cause alkali burns and effect the mucous membranes. Dust can irritate the eyes and upper respiratory system. Toxic effects noted in animals include, for acute exposures, alveolar damage with pulmonary edema.
Chronic Exposure: Dust can cause inflammation of the lining tissue of the interior of the nose and inflammation of the cornea. Hypersensitive individuals may develop an allergic dermatitis.
Carcinogenicity: Since portland cement and blended cements are manufactured from raw materials mined from the earth (limestone, marl, sand, shale, etc.) and process heat is provided by burning fossil fuels, trace, but detectable, amounts of naturally occurring, and possibly harmful, elements may be found during chemical analysis. Under ASTM standards, portland cement may contain 0.75 % insoluble residue. A fraction of these residues may be free crystalline silica. Respirable crystalline silica (quartz) can cause silicosis, a fibrosis (scarring) of the lungs and possibly cancer. There is evidence that exposure to respirable silica or the disease silicosis is associated with an increased incidence of Scleroderma, tuberculosis and kidney disorders.

Carcinogenicity Listings:	NTP:	Known carcinogen
	OSHA:	Not listed as a carcinogen
	IARC Monographs:	Group 1 Carcinogen
	California Proposition 65:	Known carcinogen

NTP: The National Toxicology Program, in its "Ninth Report on Carcinogens" (released May 15, 2000) concluded that "Respirable crystalline silica (RCS), primarily quartz dusts occurring in industrial and occupational settings, is *known to be a human carcinogen*, based on sufficient evidence of carcinogenicity from studies in humans indicating a causal relationship between exposure to RCS and increased lung cancer rates in workers exposed to crystalline silica dust (reviewed in IAC, 1997; Brown *et al.*, 1997; Hind *et al.*, 1997)

IARC: The International Agency for Research on Cancer ("IARC") concluded that there was "*sufficient evidence* in humans for the carcinogenicity of crystalline silica in the forms of quartz or cristobalite from occupational sources", and that there is "*sufficient evidence* in experimental animals for the carcinogenicity of quartz or cristobalite." The overall IARC evaluation was that "crystalline silica inhaled in the form of quartz or cristobalite from occupational sources is *carcinogenic to humans* (Group 1)." The IARC evaluation noted that "carcinogenicity was not detected in all industrial circumstances or studies. Carcinogenicity may be dependent on inherent characteristics of the crystalline silica or on external factors affecting its biological activity or distribution of its polymorphs." For further information on the IARC evaluation, see IARC Monographs on the Evaluation of carcinogenic Risks to Humans, Volume 68, "Silica, Some Silicates." (1997)

Signs and Symptoms of Exposure: Symptoms of excessive exposure to the dust include shortness of breath and reduced pulmonary function. Excessive exposure to skin and eyes especially when mixed with water can cause caustic burns as severe as third degree.

Medical Conditions Generally Aggravated by Exposure: Individuals with sensitive skin and with pulmonary and/or respiratory disease, including, but not limited to, asthma and bronchitis, or subject to eye irritation, should be precluded from exposure. Exposure to crystalline silica or the disease silicosis is associated with increased incidence of scleroderma, Tuberculosis and possibly increased incidence of kidney lesions.
Chronic Exposure: Dust can cause inflammation of the lining tissue of the interior of the nose and inflammation of the cornea. Hypersensitive individuals may develop an allergic dermatitis. (May contain trace (<0.05 %) amounts of chromium salts or compounds including hexavalent chromium, or other metals found to be hazardous or toxic in some chemical forms. These metals are mostly present as trace substitutions within the principal minerals)
Medical Conditions Generally Aggravated by Exposure: Individuals with sensitive skin and with pulmonary and/or respiratory disease, including, but not limited to, asthma and bronchitis, or subject to eye irritation, should be precluded from exposure.
Emergency First Aid Procedures:
Eyes: Immediately flush eye thoroughly with water. Continue flushing eye for at least 15 minutes, including under lids, to remove all particles. Call physician immediately.
Skin: Wash skin with cool water and pH-neutral soap or a mild detergent. Seek medical treatment if irritation or inflammation develops or persists. Seek immediate medical treatment in the event of burns.
Inhalation: Remove person to fresh air. If breathing is difficult, administer oxygen. If not breathing, give artificial respiration. Seek medical help if coughing and other symptoms do not subside. Inhalation of large amounts of portland cement require immediate medical attention.
Ingestion: Do not induce vomiting. If conscious, have the victim drink plenty of water and call a physician immediately.

SECTION VII - PRECAUTIONS FOR SAFE HANDLING AND USE

If spilled, use dustless methods (vacuum) and place into covered container for disposal or use if not contaminated or wet. Use adequate ventilation.
Waste Disposal Method: The packaging and material may be land filled; however, material should be covered to minimize generation of airborne dust. This product is not classified as a hazardous waste under RCRA or CERCLA.

SECTION VIII - CONTROL MEASURES

DO NOT BREATHE DUST. In dusty environments, the use of an OSHA, MSHA or NIOSH approved respirator and tight fitting goggles is recommended. Local exhaust can be used, if necessary, to control airborne dust levels.
The use of barrier creams or impervious gloves, boots and clothing to protect the skin from contact is recommended. Following work, workers should shower with soap and water. Precautions must be observed because burns occur with little warning -- little heat is sensed.

WARN EMPLOYEES AND/OR CUSTOMERS OF THE HAZARDS AND REQUIRED OSHA PRECAUTIONS ASSOCIATED WITH THE USE OF THIS PRODUCT.

NOTE: The information and recommendations contained herein are based upon data believed to be correct. However, no guarantee or warranty of any kind, express or implied, is made with respect to the information contained herein. We accept no responsibility and disclaim all liability for any harmful effects which may be caused by exposure to silica contained in our products.

SECTION 1:Chemical Product and Company Identification

Manufacturer: Cumberland Swan
One Swan Drive
Smyrna, TN 37167

Date: March 2000

Product: Isopropyl Alcohol (IPA)

50%, 70%, 91% and 99% IPA

Telephone: (615) 459-8900
24hr Emergency: (615) 459-8900 ext. 5270

SECTION 2: Composition/Information on Ingredients

Name: Isopropanol, IPA, 2-Propanol, Dimethyl Carbinol CAS#: 67-63-0

SECTION 3: Hazards Identification

Colorless, volatile liquid with the odor of rubbing alcohol. Isopropyl Alcohol is a dangerous fire risk. Prolonged exposure to elevated concentrations of vapors may result in irritation of the eyes, nose, and throat and central nervous system (CNS) depression. Prolonged dermal exposure can result in dry, cracking skin.

Potential Routes of Exposure: Ingestion, inhalation, dermal contact, eye contact

Target Organs: Eyes, skin, respiratory system

Symptoms of Overexposure:

Inhalation:	Mild irritation of eyes, nose and throat.
Ingestion:	Drowsiness, headache
Dermal Contact:	Dry, cracking skin
Acute Effects:	Irritation of skin and/or upper respiratory tract as noted above. Acute CNS depression may be manifested as giddiness, headache, dizziness and/or nausea.
Chronic Effects:	Chronic exposure can result in skin irritation and contact dermititus Pre-existing disorders of the skin, eyes, and respiratory tract may be exacerbated by exposure to isopropyl alcohol.

HMIS: H=1, F=3, R=0 See Section 8 for PPE information

SECTION 4: First Aid Measures

Eye:	Flush eyes with copious amount of water for at least 15 minutes
Skin:	Flush with water. If irritation persists, seek medical attention.
Ingestion:	Do not induce vomiting if victim is unconscious or drowsy. Seek medical attention or contact the poison control center.
Inhalation:	Remove victim to fresh air and provided oxygen if breathing is difficult. Seek Medical attention if breathing continues to be difficult.

SECTION 5: Fire Fighting Measures

Extinguishing Media:	Use water fog, alcohol foam, dry chemical or CO2
Unusual Fire or Explosion Hazards:	Containers exposed to intense heat from fires should be cooled with large amounts of water to prevent buildup of internal pressure due to vapor generation which could result in container rupture.
Recommendations:	Clear area of unprotected personnel. Wear complete turnout gear. Cool containers exposed to fire with water.

SECTION 6: Accidental Release Measures

Large Spills:	Eliminate all ignition sources. Equipment must be grounded to prevent sparking. Evacuate the area of unprotected personnel. Contain source of spill. Dike or otherwise confine spilled product. Uncontrolled releases to air, land, or water may be reportable to the National Response Center (1-800-424-8802).
Small Spills:	Take up with absorbent material and place in non-leaking container; seal tightly. Dispose of absorbent (see section 13)

SECTION 7: Handling and Storage

Storage Requirements:	Store in tightly closed containers in a cool, dry area away from heat and other possible ignition sources.
Handling precautions:	Use non-sparking tools to open containers. Maintain appropriate class of fire extinguishers nearby in case of fire.

SECTION 8: Exposure Controls / Personal Protection

OSHA PEL=400ppm OSHA STEL=500ppm IDLH=12,000ppm

Recommended Engineering Controls: Use explosion-proof ventilation equipment as necessary to maintain airborne concentrations below the PEL. Ground all containers to prevent static sparks during fluid transfers.

Recommended Admin Controls: Train employees on the hazards of Isopropyl Alcohol

PPE: Goggles, gloves, NIOSH approved respiratory protection required when above PEL/TWA

Recommended Hygiene Practices: Clean PPE and work clothing contaminated prior to reuse. After working with this product, be sure to wash before eating, smoking, drinking, or applying cosmetics.

SECTION 9: Physical and Chemical Properties

Appearance: Colorless Liquid UEL: 12% LEL: 2%

Odor: Mild Rubbing Alcohol Odor Threshold: 43ppm Water solubility: Miscible

	50% IPA	70%IPA	91%IPA	99%IPA
Vapor Pressure (@ 68^{0}F) approx.	29mm	23mm	33mm	33mm
Specific Gravity	.929	.878	.790	.790
Boiling Point	176 ^{0}F	176 ^{0}F	180 ^{0}F	181 ^{0}F
Flash Point (TAG Open Cup)	74.5 ^{0}F	70.5 ^{0}F	54 ^{0}F	53 ^{0}F
Freezing Point	-32-50 ^{0}C	-32-50 ^{0}C	-32-50 ^{0}C	-127 ^{0}F
Molecular Weight	47.5	47.5	47.5	60.1
Auto Ignition Temperature	No Data	No Data	No Data	750 ^{0}F

SECTION 10: Stability and Reactivity

Stability:	Stable
Polymerization:	Will not occur
Incompatible Chem:	Strong oxidizers, acetaldehyde, chlorine, ethylene oxide, acids, isocyanates
Conditions to avoid:	Heat, sparks, and open flame. Do Not store in aluminum > 120 ^{0} F
Hazardous Products:	CO and unidentified organic compounds may be formed of Decomposition

SECTION 11: Toxicological Information

LD50: 5,840 mg/kg (acute oral - rat); 13,000 mg/kg (acute dermal - rabbit)
LD50: 16,000 ppm/8hr (inhalation - rat) **Mutagenicity:** Not Indicated
LD_{lo} : 5,000 mg/kg (oral - rabbit) **Reproductive Effects**: Not Indicated
Carcinogenicity: Not identified as a carcinogen by OSHO, IARC, or NTP

SECTION 12: Ecological Information

Ecotoxicity: N/A **Environmental Fate:** N/A
Soil Absorption/Mobility: Highly Mobile
Environmental Degradation: Should be removed readily from soils and water by volatilization and biodegradation.

SECTION 13: Disposal Considerations

Disposal: Contact your supplier or a licensed contractor for detailed recommendations.
Disposal regulatory Requirements: Follow applicable Federal, state, and local regulations. Consider fuels blending as an alternative to incineration.

SECTION 14: Transport Information

DOT Shipping Name: Isopropanol DOT Packing Group: II
DOT Hazard Class: 3 DOT Label: Flammable Liquid
UN ID#: UN 1219

SECTION 15: Regulatory Information

RCRA Hazardous Waste Number/ Classification:D001 CERCLA Substance: N/A
HAZARDOUS AIR POLUTANT (CAA): No SARA 311/312 Codes: N/A
SARA Toxic Chemical: Yes, (Strong manufacturing only)
CERCLA Reportable Quantity: 10,000 lbs (Default)

SECTION 16: Other Information

Prepared by: Cumberland Swan
Sources of Information: 29 CFR1910.1000; NIOSH Pocket Guide to Chemical Hazards (1993); Occupational Health Guidelines for Chemical Hazards; NFPA Guide to Hazardous Materials - 10th Edition.
Disclaimer: While reasonable care has been taken to ensure the accuracy and completeness of the information regarding the material described herein, it is the purchaser's responsibility to ensure the suitability of such information as it applies to the purchaser's intended use of the material.

Material Safety Data Sheet

[Home] [Manufacturer] [Part Number] [NSN] [Help]

SECTION I - Material Identity

Item Name..... FACIMILE MOLDING CLAY
Part Number/Trade Name..... FACIMILE MOLDING CLAY-PART B
National Stock Number..... 4920012378414
CAGE Code..... 2R260
Part Number Indicator..... B
MSDS Number..... 181104
HAZ Code..... B

SECTION II - Manufacturer's Information

Manufacturer Name..... FLEXBAR MACHINGE CORP.
Street..... 250 GIBBS RD.
City..... CENTRAL ISLIP
State..... NY
Country..... US
Zip Code..... 11722-2612
Emergency Phone..... 516-582-8440
Information Phone..... 516-582-8440

MSDS Preparer's Information

Date MSDS Prepared/Revised..... 00JAN97
Active Indicator..... N

Alternate Vendors

Vendor #1 CAGE..... 2R260

SECTION III - Physical/Chemical Characteristics

Appearance/Odor..... PLIABLE CLAY; NO ODOR
Boiling Point..... N/K
Melting Point..... N/R
Vapor Pressure..... N/R
Vapor Density..... N/R
Specific Gravity..... 2.447
Evaporation Rate..... N/K
Solubility in Water..... N/R
Percent Volatiles by Volume..... N/K
Chemical pH..... N/K
Container Type..... R

Container Pressure Code..... 4
Temperature Code..... 8
Product State Code..... U

SECTION IV - Fire and Explosion Hazard Data

Flash Point..... 465
Flash Point Method..... UNK
Lower Explosion Limit..... N/K
Upper Explosion Limit..... N/K
Extinguishing Media..... FOAM, CHEMICAL, WATER FOG
Special Fire Fighting Procedures..... USE SCBA AND PROTECTIVE CLOTHING. COOL FIRE EXPOSED CONTIANERS W/WATER FOG
Unusual Fire/Explosion Hazards..... NONE

SECTION V - Reactivity Data

Stability..... YES
Stability Conditions to Avoid..... SUNLIGHT
Materials to Avoid..... NONE KNONW
Hazardous Decomposition Products..... CO, CO2
Hazardous Polymerization..... NO
Polymerization Conditions to Avoid..... WILL NOT OCCUR
LD50 - LD50 Mixture..... N/R

SECTION VI - Health Hazard Data

Route of Entry: Skin..... NO
Route of Entry: Ingestion..... NO
Route of Entry: Inhalation..... NO
Health Hazards - Acute and Chronic..... EYES: MAY CAUSE IRRITATION/MECHANICAL INJURY SKIN: MAY CAUSE IRRITATION
Carcinogenity: NTP..... NO
Carcinogenity: IARC..... NO
Carcinogenity: OSHA..... NO
Symptoms of Overexposure..... EYES/SKIN: MAY CAUSE IRRITATION
Medical Cond. Aggrevated by Exposure.... NOT LIKELY TO AGGRAVATE EXSISTING MEDICAL CONDITION
Emergency/First Aid Procedures..... SKIN: REMOVE CONTAMINATED CLOTHING; WASH W/SOAP & WATER EYES:REMOVE AS A FOREIGN OBJECT. INHALE: NO FIRST AID REQUIRED. INGEST: GET PROMPT QULIFIED MEDICAL ATTN.

SECTION VII - Precautions for Safe Handling and Use

Steps if Material Released/Spilled..... PICK UP AND PUT INTO SUITABLE CONTAINER
Neutralizing Agent..... NONE
Waste Disposal Method..... DISPOSE IN ACCORDANCE TO ALL FEDERAL, STATE AND LOCAL LAW.

Handling and Storage Precautions..... STORE IN COOL, WELL-VENTILATED PLACE. KEEP CONTAINER CLOSED WHEN NOT IN USE. KEEP AWAY FROM SUNLIGHT. GROUND METAL CONTAINERS WHEN TRANSFERRING.

Other Precautions..... FOLLOW LABEL INSTRUCTIONS. USE EXPLOSION PROOF EQUIP. CHECK INHIBITOR LEVLES EVERY THREE MONTHS

SECTION VIII - Control Measures

Respiratory Protection..... NONE NEEDED IN NORMAL SERVICE
Ventilation..... USE GENERAL DILUTION VENTILATION
Protective Gloves..... NONE NEEDED
Eye Protection..... NONE NEEDED
Other Protective Equipment..... NONE
Work Hygenic Practices..... WASH THOROUGHLY AFTER USING, BEFORE EATING OR SMOKING
Supplemental Health/Safety Data..... NONE
Disposal Code..... O

SECTION IX - Label Data

Protect Eye..... NO
Protect Skin..... NO
Protect Respiratory..... NO
Chronic Indicator..... NO
Contact Code..... NONE
Fire Code..... UNKNOWN
Health Code..... UNKNOWN
React Code..... UNKNOWN

SECTION X - Transportation Data

Container Quantity..... 1
Unit of Measure..... OZN

SECTION XI - Site Specific/Reporting Information

Volatile Organic Compounds (P/G)..... 0
Volatile Organic Compounds (G/L)..... 0

SECTION XII - Ingredients/Identity Information

Ingredient #..... 01
Ingredient Name..... KAOLIN
CAS Number..... 1332587
Proprietary..... NO
Percent..... 0
OSHA PEL..... 15 MG/M3

ACGIH TLV..... 2 MG/M3
Ingredient #..... 02
Ingredient Name..... CALCIUM SULFATE
CAS Number..... 7778189
Proprietary..... NO
Percent..... 0
OSHA PEL..... 15 MG/M3
ACGIH TLV..... 10 MG/M3
Ingredient #..... 03
Ingredient Name..... GREASE, PETROLEUM
CAS Number..... 8009038
Proprietary..... NO
Percent..... 0
OSHA PEL..... N/E
ACGIH TLV..... N/E
Ingredient #..... 04
Ingredient Name..... CASTOR OIL
CAS Number..... 8001794
Proprietary..... NO
Percent..... 0
OSHA PEL..... N/E
ACGIH TLV..... N/E
Ingredient #..... 05
Ingredient Name..... CALCIUM CARBONATE (MARBLE) (LIMESTONE)
CAS Number..... 1317653
Proprietary..... NO
Percent..... 0
OSHA PEL..... 15 MG/M3
ACGIH TLV..... 10 MG/M3

NOTICE: For additional information, contact BIOENVIRONMENTAL

HMMS Intranet - 12 Dec 2006 11:34 - web_msds.display - Visit the Official HMMS Website at www.hmms.com

Attachment C

Chemical Safety Cards

New Jersey Department of Health and Senior Services

HAZARDOUS SUBSTANCE FACT SHEET

Common Name: **TRICHLOROETHYLENE**

CAS Number: 79-01-6
DOT Number: UN 1710

RTK Substance number: 1890
Date: April 1994 Revision: January 2000

HAZARD SUMMARY

* **Trichloroethylene** can affect you when breathed in.
* **Trichloroethylene** may cause mutations. Handle with extreme caution.
* Contact can irritate and burn the skin and eyes with possible eye damage.
* Exposure can cause lightheadedness, dizziness, unconsciousness, visual disturbances, nausea and vomiting. Very high levels can cause irregular heartbeat which can be fatal.
* **Trichloroethylene** may cause a skin allergy. If allergy develops, very low future exposure can cause itching and a skin rash.
* Repeated exposure can cause memory loss, headache, and depression.
* **Trichloroethylene** may damage the liver and kidneys.

IDENTIFICATION

Trichloroethylene is a colorless liquid with a sweet odor. It is used as a solvent for degreasing and dry cleaning, and in printing inks, paints, lacquers, varnishes, and adhesives.

REASON FOR CITATION

* **Trichloroethylene** is on the Hazardous Substance List because it is regulated by OSHA and cited by ACGIH, DOT, NIOSH, DEP, HHAG, NFPA and EPA.
* This chemical is on the Special Health Hazard Substance List because it is a **MUTAGEN**.
* Definitions are provided on page 5.

HOW TO DETERMINE IF YOU ARE BEING EXPOSED

The New Jersey Right to Know Act requires most employers to label chemicals in the workplace and requires public employers to provide their employees with information and training concerning chemical hazards and controls. The federal OSHA Hazard Communication Standard, 1910.1200, requires private employers to provide similar training and information to their employees.

* Exposure to hazardous substances should be routinely evaluated. This may include collecting personal and area air samples. You can obtain copies of sampling results from your employer. You have a legal right to this information under OSHA 1910.1020.
* If you think you are experiencing any work-related health problems, see a doctor trained to recognize occupational diseases. Take this Fact Sheet with you.
* **ODOR THRESHOLD = 82 to 110 ppm.**
* The range of accepted odor threshold values is quite broad. Caution should be used in relying on odor alone as a warning of potentially hazardous exposures.

WORKPLACE EXPOSURE LIMITS

OSHA: The legal airborne permissible exposure limit (PEL) is **100 ppm** averaged over an 8-hour workshift, **200 ppm** not to be exceeded during any 15 minute work period, and **300 ppm** for 5 minutes in any 2-hour work period.

NIOSH: The recommended airborne exposure limit is **25 ppm** averaged over a 10-hour workshift.

ACGIH: The recommended airborne exposure limit is **50 ppm** averaged over an 8-hour workshift and **100 ppm** as a STEL (short term exposure limit).

* **Trichloroethylene** may cause mutations. All contact with this chemical should be reduced to the lowest possible level.

WAYS OF REDUCING EXPOSURE

* Where possible, enclose operations and use local exhaust ventilation at the site of chemical release. If local exhaust ventilation or enclosure is not used, respirators should be worn.
* Wear protective work clothing.
* Wash thoroughly immediately after exposure to **Trichloroethylene** and at the end of the workshift.
* Post hazard and warning information in the work area. In addition, as part of an ongoing education and training effort, communicate all information on the health and safety hazards of **Trichloroethylene** to potentially exposed workers.

This Fact Sheet is a summary source of information of all potential and most severe health hazards that may result from exposure. Duration of exposure, concentration of the substance and other factors will affect your susceptibility to any of the potential effects described below.

HEALTH HAZARD INFORMATION

Acute Health Effects

The following acute (short-term) health effects may occur immediately or shortly after exposure to **Trichloroethylene**:

* Contact can irritate and burn the skin and eyes with possible eye damage.
* Exposure can cause lightheadedness, dizziness, unconsciousness, visual disturbances, nausea and vomiting. Very high levels can cause irregular heartbeat which can be fatal.

Chronic Health Effects

The following chronic (long-term) health effects can occur at some time after exposure to **Trichloroethylene** and can last for months or years:

Cancer Hazard

* There is limited evidence that **Trichloroethylene** causes cancer in animals. It may cause lung and liver cancer.
* **Trichloroethylene** may cause mutations (genetic changes).
* Many scientists believe there is no safe level of exposure to a carcinogen.

Reproductive Hazard

* There is no evidence that **Trichloroethylene** affects reproduction. This is based on test results presently available to the New Jersey Department of Health and Senior Services from published studies.

Other Long-Term Effects

* **Trichloroethylene** may cause a skin allergy. If allergy develops, very low future exposure can cause itching and a skin rash.
* Repeated exposure can cause memory loss, headache, intolerance of alcohol, depression, and weakness in the arms and legs.
* **Trichloroethylene** may damage the liver and kidneys.
* Repeated contact can cause irritation, blistering, roughening, and cracking of the exposed skin.

MEDICAL

Medical Testing

For those with frequent or potentially high exposure (half the TLV or greater, or significant skin contact), the following are recommended before beginning work and at regular times after that:

* Liver and kidney function tests.

If symptoms develop or overexposure is suspected, the following are recommended:

* Exam of the nervous system. Consider nerve conduction tests.
* Urinary *Trichloracetic Acid* level (for repeated exposures) or blood **Trichloroethylene** levels (for acute exposure).
* Evaluation by a qualified allergist, including careful exposure history and special testing, may help diagnose skin allergy.

Any evaluation should include a careful history of past and present symptoms with an exam. Medical tests that look for damage already done are not a substitute for controlling exposure.

Request copies of your medical testing. You have a legal right to this information under OSHA 1910.1020.

Mixed Exposures

* Because more than light alcohol consumption can cause liver damage, drinking alcohol can increase the liver damage caused by **Trichloroethylene**.

WORKPLACE CONTROLS AND PRACTICES

Unless a less toxic chemical can be substituted for a hazardous substance, **ENGINEERING CONTROLS** are the most effective way of reducing exposure. The best protection is to enclose operations and/or provide local exhaust ventilation at the site of chemical release. Isolating operations can also reduce exposure. Using respirators or protective equipment is less effective than the controls mentioned above, but is sometimes necessary.

In evaluating the controls present in your workplace, consider: (1) how hazardous the substance is, (2) how much of the substance is released into the workplace and (3) whether harmful skin or eye contact could occur. Special controls should be in place for highly toxic chemicals or when significant skin, eye, or breathing exposures are possible.

In addition, the following control is recommended:

* Where possible, automatically pump liquid **Trichloroethylene** from drums or other storage containers to process containers.

Good **WORK PRACTICES** can help to reduce hazardous exposures. The following work practices are recommended:

* Workers whose clothing has been contaminated by **Trichloroethylene** should change into clean clothing promptly.
* Contaminated work clothes should be laundered by individuals who have been informed of the hazards of exposure to **Trichloroethylene**.
* Eye wash fountains should be provided in the immediate work area for emergency use.
* If there is the possibility of skin exposure, emergency shower facilities should be provided.
* On skin contact with **Trichloroethylene**, immediately wash or shower to remove the chemical. At the end of the workshift, wash any areas of the body that may have contacted **Trichloroethylene**, whether or not known skin contact has occurred.
* Do not eat, smoke, or drink where **Trichloroethylene** is handled, processed, or stored, since the chemical can be swallowed. Wash hands carefully before eating, drinking, smoking, or using the toilet.
* Do not smoke in the work area. Even a little vapor inhaled through a burning cigarette, cigar, or pipe will be converted into more highly toxic substances.

PERSONAL PROTECTIVE EQUIPMENT

WORKPLACE CONTROLS ARE BETTER THAN PERSONAL PROTECTIVE EQUIPMENT. However, for some jobs (such as outside work, confined space entry, jobs done only once in a while, or jobs done while workplace controls are being installed), personal protective equipment may be appropriate.

OSHA 1910.132 requires employers to determine the appropriate personal protective equipment for each hazard and to train employees on how and when to use protective equipment.

The following recommendations are only guidelines and may not apply to every situation.

Clothing

* Avoid skin contact with **Trichloroethylene**. Wear solvent-resistant gloves and clothing. Safety equipment suppliers/manufacturers can provide recommendations on the most protective glove/clothing material for your operation.
* All protective clothing (suits, gloves, footwear, headgear) should be clean, available each day, and put on before work.
* ACGIH recommends *Viton, Polyvinyl Alcohol, Teflon* and *Silver Shield* as protective materials.

Eye Protection

* Wear indirect-vent, impact and splash resistant goggles when working with liquids.
* Wear a face shield along with goggles when working with corrosive, highly irritating or toxic substances.
* Contact lenses should not be worn when working with this substance.

Respiratory Protection

IMPROPER USE OF RESPIRATORS IS DANGEROUS. Such equipment should only be used if the employer has a written program that takes into account workplace conditions, requirements for worker training, respirator fit testing and medical exams, as described in OSHA 1910.134.

* Where the potential exists for exposure over **25 ppm**, use a MSHA/NIOSH approved supplied-air respirator with a full facepiece operated in a pressure-demand or other positive-pressure mode. For increased protection use in combination with an auxiliary self-contained breathing apparatus operated in a pressure-demand or other positive-pressure mode.
* Exposure to **1,000 ppm** is immediately dangerous to life and health. If the possibility of exposure above **1,000** exists, use a MSHA/NIOSH approved self-contained breathing apparatus with a full facepiece operated in a pressure-demand or other positive-pressure mode.

HANDLING AND STORAGE

* Prior to working with **Trichloroethylene** you should be trained on its proper handling and storage.
* **Trichloroethylene** must be handled and stored away from operations which generate HIGH TEMPERATURES such as ARC WELDING or CUTTING, UNSHIELDED RESISTANCE HEATING, OPEN FLAMES, and HIGH INTENSITY LIGHT, as poisonous gases are produced.
* **Trichloroethylene** must be stored to avoid contact with CHEMICALLY ACTIVE METALS (such as ALUMINUM, POTASSIUM, SODIUM, MAGNESIUM and ZINC); NITRIC ACID; and REDUCING AGENTS since violent reactions occur.
* **Trichloroethylene** is not compatible with OXIDIZING AGENTS (such as PERCHLORATES, PEROXIDES, PERMANGANATES, CHLORATES, NITRATES, CHLORINE, BROMINE and FLUORINE).
* **Trichloroethylene** in contact with STRONG BASES (such as SODIUM HYDROXIDE and POTASSIUM HYDROXIDE) results in the evolution of spontaneously flammable and explosive *Dichloroacetylene*.
* Store in tightly closed containers in a cool, well-ventilated area away from SUNLIGHT and MOISTURE.

QUESTIONS AND ANSWERS

Q: If I have acute health effects, will I later get chronic health effects?
A: Not always. Most chronic (long-term) effects result from repeated exposures to a chemical.

Q: Can I get long-term effects without ever having short-term effects?
A: Yes, because long-term effects can occur from repeated exposures to a chemical at levels not high enough to make you immediately sick.

Q: What are my chances of getting sick when I have been exposed to chemicals?
A: The likelihood of becoming sick from chemicals is increased as the amount of exposure increases. This is determined by the length of time and the amount of material to which someone is exposed.

Q: When are higher exposures more likely?
A: Conditions which increase risk of exposure include physical and mechanical processes (heating, pouring, spraying, spills and evaporation from large surface areas such as open containers), and "confined space" exposures (working inside vats, reactors, boilers, small rooms, etc.).

Q: Is the risk of getting sick higher for workers than for community residents?
A: Yes. Exposures in the community, except possibly in cases of fires or spills, are usually much lower than those found in the workplace. However, people in the community may be exposed to contaminated water as well as to chemicals in the air over long periods. This may be a problem for children or people who are already ill.

Q: What are the likely health problems from chemicals which cause mutations?
A: There are two primary health concerns associated with mutagens: (1) cancers can result from changes induced in cells and, (2) adverse reproductive and developmental outcomes can result from damage to the egg and sperm cells.

Q: Don't all chemicals cause cancer?
A: No. Most chemicals tested by scientists are not cancer-causing.

Q: Should I be concerned if a chemical causes cancer in animals?
A: Yes. Most scientists agree that a chemical that causes cancer in animals should be treated as a suspected human carcinogen unless proven otherwise.

Q: But don't they test animals using much higher levels of a chemical than people usually are exposed to?
A: Yes. That's so effects can be seen more clearly using fewer animals. But high doses alone don't cause cancer unless it's a cancer agent. In fact, a chemical that causes cancer in animals at high doses could cause cancer in humans exposed to low doses.

The following information is available from:

New Jersey Department of Health and Senior Services
Occupational Health Service
PO Box 360
Trenton, NJ 08625-0360
(609) 984-1863
(609) 292-5677 (fax)

Web address: http://www.state.nj.us/health/eoh/odisweb/

Industrial Hygiene Information
Industrial hygienists are available to answer your questions regarding the control of chemical exposures using exhaust ventilation, special work practices, good housekeeping, good hygiene practices, and personal protective equipment including respirators. In addition, they can help to interpret the results of industrial hygiene survey data.

Medical Evaluation
If you think you are becoming sick because of exposure to chemicals at your workplace, you may call personnel at the Department of Health and Senior Services, Occupational Health Service, who can help you find the information you need.

Public Presentations
Presentations and educational programs on occupational health or the Right to Know Act can be organized for labor unions, trade associations and other groups.

Right to Know Information Resources
The Right to Know Infoline (609) 984-2202 can answer questions about the identity and potential health effects of chemicals, list of educational materials in occupational health, references used to prepare the Fact Sheets, preparation of the Right to Know survey, education and training programs, labeling requirements, and general information regarding the Right to Know Act. Violations of the law should be reported to (609) 984-2202.

DEFINITIONS

ACGIH is the American Conference of Governmental Industrial Hygienists. It recommends upper limits (called TLVs) for exposure to workplace chemicals.

A **carcinogen** is a substance that causes cancer.

The **CAS number** is assigned by the Chemical Abstracts Service to identify a specific chemical.

A **combustible** substance is a solid, liquid or gas that will burn.

A **corrosive** substance is a gas, liquid or solid that causes irreversible damage to human tissue or containers.

DEP is the New Jersey Department of Environmental Protection.

DOT is the Department of Transportation, the federal agency that regulates the transportation of chemicals.

EPA is the Environmental Protection Agency, the federal agency responsible for regulating environmental hazards.

A **fetus** is an unborn human or animal.

A **flammable** substance is a solid, liquid, vapor or gas that will ignite easily and burn rapidly.

The **flash point** is the temperature at which a liquid or solid gives off vapor that can form a flammable mixture with air.

HHAG is the Human Health Assessment Group of the federal EPA.

IARC is the International Agency for Research on Cancer, a scientific group that classifies chemicals according to their cancer-causing potential.

A **miscible** substance is a liquid or gas that will evenly dissolve in another.

mg/m^3 means milligrams of a chemical in a cubic meter of air. It is a measure of concentration (weight/volume).

MSHA is the Mine Safety and Health Administration, the federal agency that regulates mining. It also evaluates and approves respirators.

A **mutagen** is a substance that causes mutations. A **mutation** is a change in the genetic material in a body cell. Mutations can lead to birth defects, miscarriages, or cancer.

NAERG is the North American Emergency Response Guidebook. It was jointly developed by Transport Canada, the United States Department of Transportation and the Secretariat of Communications and Transportation of Mexico. It is a guide for first responders to quickly identify the specific or generic hazards of material involved in a transportation incident, and to protect themselves and the general public during the initial response phase of the incident.

NCI is the National Cancer Institute, a federal agency that determines the cancer-causing potential of chemicals.

NFPA is the National Fire Protection Association. It classifies substances according to their fire and explosion hazard.

NIOSH is the National Institute for Occupational Safety and Health. It tests equipment, evaluates and approves respirators, conducts studies of workplace hazards, and proposes standards to OSHA.

NTP is the National Toxicology Program which tests chemicals and reviews evidence for cancer.

OSHA is the Occupational Safety and Health Administration, which adopts and enforces health and safety standards.

PEOSHA is the Public Employees Occupational Safety and Health Act, a state law which sets PELs for New Jersey public employees.

ppm means parts of a substance per million parts of air. It is a measure of concentration by volume in air.

A **reactive** substance is a solid, liquid or gas that releases energy under certain conditions.

A **teratogen** is a substance that causes birth defects by damaging the fetus.

TLV is the Threshold Limit Value, the workplace exposure limit recommended by ACGIH.

The **vapor pressure** is a measure of how readily a liquid or a solid mixes with air at its surface. A higher vapor pressure indicates a higher concentration of the substance in air and therefore increases the likelihood of breathing it in.

>>>>>>>>>>>>>>>>>> EMERGENCY INFORMATION <<<<<<<<<<<<<<<<<<

Common Name: **TRICHLOROETHYLENE**
DOT Number: **UN 1710**
NAERG Code: **160**
CAS Number: **79-01-6**

Hazard rating	NJDHSS	NFPA
FLAMMABILITY	-	1
REACTIVITY	-	0
POISONOUS GASES ARE PRODUCED IN FIRE CONTAINERS MAY EXPLODE IN FIRE		

Hazard Rating Key: 0=minimal; 1=slight; 2=moderate; 3=serious; 4=severe

FIRE HAZARDS

* Extinguish fire using an agent suitable for type of surrounding fire. **Trichloroethylene** itself does not burn.
* POISONOUS GASES ARE PRODUCED IN FIRE, including *Phosgene* and *Hydrogen Chloride*.
* CONTAINERS MAY EXPLODE IN FIRE.
* Use water spray to keep fire-exposed containers cool.
* If employees are expected to fight fires, they must be trained and equipped as stated in OSHA 1910.156.

SPILLS AND EMERGENCIES

If **Trichloroethylene** is spilled or leaked, take the following steps:

* Evacuate persons not wearing protective equipment from area of spill or leak until clean-up is complete.
* Absorb liquids in vermiculite, dry sand, earth, or a similar material and deposit in sealed containers.
* Ventilate and wash area after clean-up is complete.
* It may be necessary to contain and dispose of **Trichloroethylene** as a HAZARDOUS WASTE. Contact your Department of Environmental Protection (DEP) or your regional office of the federal Environmental Protection Agency (EPA) for specific recommendations.
* If employees are required to clean-up spills, they must be properly trained and equipped. OSHA 1910.120(q) may be applicable.

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FOR LARGE SPILLS AND FIRES immediately call your fire department. You can request emergency information from the following:

CHEMTREC: (800) 424-9300
NJDEP HOTLINE: (609) 292-7172

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HANDLING AND STORAGE (See page 3)

FIRST AID

In NJ, for POISON INFORMATION call 1-800-764-7661

Eye Contact

* Immediately flush with large amounts of water for at least 15 minutes, occasionally lifting upper and lower lids. Seek medical attention immediately.

Skin Contact

* Quickly remove contaminated clothing. Immediately wash area with large amounts of soap and water. Seek medical attention immediately.

Breathing

* Remove the person from exposure.
* Begin rescue breathing (using universal precautions) if breathing has stopped and CPR if heart action has stopped.
* Transfer promptly to a medical facility.

PHYSICAL DATA

Vapor Pressure: 58 mm Hg at 68°F (20°C)
Water Solubility: Insoluble

OTHER COMMONLY USED NAMES

Chemical Name:
Trichloroethene
Other Names:
1,2,2-Trichloroethylene; Tri; TCE; Trilene

Not intended to be copied and sold for commercial purposes.

NEW JERSEY DEPARTMENT OF HEALTH AND SENIOR SERVICES
Right to Know Program
PO Box 368, Trenton, NJ 08625-0368
(609) 984-2202

New Jersey Department of Health and Senior Services

HAZARDOUS SUBSTANCE FACT SHEET

Common Name: **TETRACHLOROETHYLENE**

CAS Number: 127-18-4
DOT Number: UN 1897

RTK Substance number: 1810
Date: April 1996 Revision: March 2002

HAZARD SUMMARY

* ***Tetrachloroethylene*** *can affect you when breathed in and* by passing through your skin.
* **Tetrachloroethylene** should be handled as a CARCINOGEN–WITH EXTREME CAUTION.
* **Tetrachloroethylene** can cause reproductive damage. Handle with extreme caution.
* Contact can cause skin irritation, burns and drying and cracking of the skin.
* Exposure to **Tetrachloroethylene** can irritate the eyes, nose, mouth and throat.
* High exposure can cause headache, dizziness, lightheadedness, nausea, vomiting and even passing out.
* Breathing **Tetrachloroethylene** can irritate the lungs causing coughing and/or shortness of breath. Higher exposures can cause a build-up of fluid in the lungs (pulmonary edema), a medical emergency, with severe shortness of breath.
* **Tetrachloroethylene** may damage the liver and kidneys and affect the nervous system.

IDENTIFICATION

Tetrachloroethylene is a clear liquid with a sweet *Chloroform*-like odor. It is used in dry cleaning and metal degreasing.

REASON FOR CITATION

* **Tetrachloroethylene** is on the Hazardous Substance List because it is regulated by OSHA and cited by ACGIH, DOT, NIOSH, NTP, DEP, IARC, HHAG, NFPA and EPA.
* This chemical is on the Special Health Hazard Substance List because it is a **CARCINOGEN**.
* Definitions are provided on page 5.

HOW TO DETERMINE IF YOU ARE BEING EXPOSED

The New Jersey Right to Know Act requires most employers to label chemicals in the workplace and requires public employers to provide their employees with information and training concerning chemical hazards and controls. The federal OSHA Hazard Communication Standard, 1910.1200, requires private employers to provide similar training and information to their employees.

* Exposure to hazardous substances should be routinely evaluated. This may include collecting personal and area air samples. You can obtain copies of sampling results from your employer. You have a legal right to this information under OSHA 1910.1020.
* If you think you are experiencing any work-related health problems, see a doctor trained to recognize occupational diseases. Take this Fact Sheet with you.
* **ODOR THRESHOLD = 47 ppm.**
* The range of accepted odor threshold values is quite broad. Caution should be used in relying on odor alone as a warning of potentially hazardous exposures.

WORKPLACE EXPOSURE LIMITS

OSHA: The legal airborne permissible exposure limit (PEL) is **100 ppm** averaged over an 8-hour workshift, **200 ppm** not to be exceeded during any 15 minute work period, and **300 ppm** for 5 minutes during any 3 hours.

NIOSH: Recommends that exposure to occupational carcinogens be limited to the lowest feasible concentration.

ACGIH: The recommended airborne exposure limit is **25 ppm** averaged over an 8-hour workshift and **100 ppm** as a STEL (short-term exposure limit).

* **Tetrachloroethylene** may be a CARCINOGEN in humans. There may be no safe level of exposure to a carcinogen, so all contact should be reduced to the lowest possible level.
* The above exposure limits are for air levels only. When skin contact also occurs, you may be overexposed, even though air levels are less than the limits listed above.

WAYS OF REDUCING EXPOSURE

* Where possible, enclose operations and use local exhaust ventilation at the site of chemical release. If local exhaust ventilation or enclosure is not used, respirators should be worn.
* Wear protective work clothing.
* Wash thoroughly immediately after exposure to **Tetrachloroethylene** and at the end of the workshift.

* Post hazard and warning information in the work area. In addition, as part of an ongoing education and training effort, communicate all information on the health and safety hazards of **Tetrachloroethylene** to potentially exposed workers.

This Fact Sheet is a summary source of information of all potential and most severe health hazards that may result from exposure. Duration of exposure, concentration of the substance and other factors will affect your susceptibility to any of the potential effects described below.

HEALTH HAZARD INFORMATION

Acute Health Effects

The following acute (short-term) health effects may occur immediately or shortly after exposure to **Tetrachloroethylene**:

* Contact can cause skin irritation and burns.
* Exposure to **Tetrachloroethylene** can irritate the eyes, nose, mouth and throat.
* High exposure can cause headache, dizziness, lightheadedness, nausea, vomiting and even passing out.
* Breathing **Tetrachloroethylene** can irritate the lungs causing coughing and/or shortness of breath. Higher exposures can cause a build-up of fluid in the lungs (pulmonary edema), a medical emergency, with severe shortness of breath.

Chronic Health Effects

The following chronic (long-term) health effects can occur at some time after exposure to **Tetrachloroethylene** and can last for months or years:

Cancer Hazard

* **Tetrachloroethylene** may be a CARCINOGEN in humans since it has been shown to cause liver cancer in animals.
* Many scientists believe there is no safe level of exposure to a carcinogen.

Reproductive Hazard

* **Tetrachloroethylene** may damage the developing fetus.

Other Long-Term Effects

* **Tetrachloroethylene** may damage the liver and kidneys and affect the nervous system.
* Long-term exposure can cause drying and cracking of the skin.

MEDICAL

Medical Testing

For those with frequent or potentially high exposure (half the PEL or greater, or significant skin contact), the following are recommended before beginning work and at regular times after that:

* Liver and kidney function tests.
* Exam of the nervous system.

If symptoms develop or overexposure is suspected, the following is recommended:

* Consider chest x-ray after acute overexposure.

Any evaluation should include a careful history of past and present symptoms with an exam. Medical tests that look for damage already done are not a substitute for controlling exposure.

Request copies of your medical testing. You have a legal right to this information under OSHA 1910.1020.

Mixed Exposures

* Because more than light alcohol consumption can cause liver damage, drinking alcohol can increase the liver damage caused by **Tetrachloroethylene**.
* Because smoking can cause heart disease, as well as lung cancer, emphysema, and other respiratory problems, it may worsen respiratory conditions caused by chemical exposure. Even if you have smoked for a long time, stopping now will reduce your risk of developing health problems.

WORKPLACE CONTROLS AND PRACTICES

Unless a less toxic chemical can be substituted for a hazardous substance, **ENGINEERING CONTROLS** are the most effective way of reducing exposure. The best protection is to enclose operations and/or provide local exhaust ventilation at the site of chemical release. Isolating operations can also reduce exposure. Using respirators or protective equipment is less effective than the controls mentioned above, but is sometimes necessary.

In evaluating the controls present in your workplace, consider: (1) how hazardous the substance is, (2) how much of the substance is released into the workplace and (3) whether harmful skin or eye contact could occur. Special controls should be in place for highly toxic chemicals or when significant skin, eye, or breathing exposures are possible.

In addition, the following control is recommended:

* Where possible, automatically pump liquid **Tetrachloroethylene** from drums or other storage containers to process containers.

Good **WORK PRACTICES** can help to reduce hazardous exposures. The following work practices are recommended:

* Workers whose clothing has been contaminated by **Tetrachloroethylene** should change into clean clothing promptly.

* Contaminated work clothes should be laundered by individuals who have been informed of the hazards of exposure to **Tetrachloroethylene**.
* Eye wash fountains should be provided in the immediate work area for emergency use.
* If there is the possibility of skin exposure, emergency shower facilities should be provided.
* On skin contact with **Tetrachloroethylene**, immediately wash or shower to remove the chemical. At the end of the workshift, wash any areas of the body that may have contacted **Tetrachloroethylene**, whether or not known skin contact has occurred.
* Do not eat, smoke, or drink where **Tetrachloroethylene** is handled, processed, or stored, since the chemical can be swallowed. Wash hands carefully before eating, drinking, applying cosmetics, smoking, or using the toilet.

PERSONAL PROTECTIVE EQUIPMENT

WORKPLACE CONTROLS ARE BETTER THAN PERSONAL PROTECTIVE EQUIPMENT. However, for some jobs (such as outside work, confined space entry, jobs done only once in a while, or jobs done while workplace controls are being installed), personal protective equipment may be appropriate.

OSHA 1910.132 requires employers to determine the appropriate personal protective equipment for each hazard and to train employees on how and when to use protective equipment.

The following recommendations are only guidelines and may not apply to every situation.

Clothing

* Avoid skin contact with **Tetrachloroethylene**. Wear protective gloves and clothing. Safety equipment suppliers/manufacturers can provide recommendations on the most protective glove/clothing material for your operation.
* All protective clothing (suits, gloves, footwear, headgear) should be clean, available each day, and put on before work.
* ACGIH recommends *Nitrile Rubber, Polyvinyl Alcohol* and *Viton* as protective materials.

Eye Protection

* Wear indirect-vent, impact and splash resistant goggles when working with liquids.
* Wear a face shield along with goggles when working with corrosive, highly irritating or toxic substances.
* Contact lenses should not be worn when working with this substance.

Respiratory Protection

IMPROPER USE OF RESPIRATORS IS DANGEROUS. Such equipment should only be used if the employer has a written program that takes into account workplace conditions, requirements for worker training, respirator fit testing and medical exams, as described in OSHA 1910.134.

* Where the potential exists for exposure over **25 ppm**, use a NIOSH approved supplied-air respirator with a full facepiece operated in a pressure-demand or other positive-pressure mode. For increased protection use in combination with an auxiliary self-contained breathing apparatus operated in a pressure-demand or other positive-pressure mode.
* Exposure to **150 ppm** is immediately dangerous to life and health. If the possibility of exposure above **150 ppm** exists, use a NIOSH approved self-contained breathing apparatus with a full facepiece operated in a pressure-demand or other positive-pressure mode.

QUESTIONS AND ANSWERS

Q: If I have acute health effects, will I later get chronic health effects?
A: Not always. Most chronic (long-term) effects result from repeated exposures to a chemical.

Q: Can I get long-term effects without ever having short-term effects?
A: Yes, because long-term effects can occur from repeated exposures to a chemical at levels not high enough to make you immediately sick.

Q: What are my chances of getting sick when I have been exposed to chemicals?
A: The likelihood of becoming sick from chemicals is increased as the amount of exposure increases. This is determined by the length of time and the amount of material to which someone is exposed.

Q: When are higher exposures more likely?
A: Conditions which increase risk of exposure include physical and mechanical processes (heating, pouring, spraying, spills and evaporation from large surface areas such as open containers), and "confined space" exposures (working inside vats, reactors, boilers, small rooms, etc.).

Q: Is the risk of getting sick higher for workers than for community residents?
A: Yes. Exposures in the community, except possibly in cases of fires or spills, are usually much lower than those found in the workplace. However, people in the community may be exposed to contaminated water as well as to chemicals in the air over long periods. This may be a problem for children or people who are already ill.

Q: Don't all chemicals cause cancer?
A: No. Most chemicals tested by scientists are not cancer-causing.

Q: Should I be concerned if a chemical causes cancer in animals?
A: Yes. Most scientists agree that a chemical that causes cancer in animals should be treated as a suspected human carcinogen unless proven otherwise.

Q: But don't they test animals using much higher levels of a chemical than people usually are exposed to?

A: Yes. That's so effects can be seen more clearly using fewer animals. But high doses alone don't cause cancer unless it's a cancer agent. In fact, a chemical that causes cancer in animals at high doses could cause cancer in humans exposed to low doses.

Q: Can men as well as women be affected by chemicals that cause reproductive system damage?

A: Yes. Some chemicals reduce potency or fertility in both men and women. Some damage sperm and eggs, possibly leading to birth defects.

Q: Who is at the greatest risk from reproductive hazards?

A: Pregnant women are at greatest risk from chemicals that harm the developing fetus. However, chemicals may affect the ability to have children, so both men and women of childbearing age are at high risk.

The following information is available from:

New Jersey Department of Health and Senior Services
Occupational Health Service
PO Box 360
Trenton, NJ 08625-0360
(609) 984-1863
(609) 984-7407 (fax)

Web address: http://www.state.nj.us/health/eoh/odisweb/

Industrial Hygiene Information

Industrial hygienists are available to answer your questions regarding the control of chemical exposures using exhaust ventilation, special work practices, good housekeeping, good hygiene practices, and personal protective equipment including respirators. In addition, they can help to interpret the results of industrial hygiene survey data.

Medical Evaluation

If you think you are becoming sick because of exposure to chemicals at your workplace, you may call personnel at the Department of Health and Senior Services, Occupational Health Service, who can help you find the information you need.

Public Presentations

Presentations and educational programs on occupational health or the Right to Know Act can be organized for labor unions, trade associations and other groups.

Right to Know Information Resources

The Right to Know Infoline (609) 984-2202 can answer questions about the identity and potential health effects of chemicals, list of educational materials in occupational health, references used to prepare the Fact Sheets, preparation of the Right to Know Survey, education and training programs, labeling requirements, and general information regarding the Right to Know Act. Violations of the law should be reported to (609) 984-2202.

DEFINITIONS

ACGIH is the American Conference of Governmental Industrial Hygienists. It recommends upper limits (called TLVs) for exposure to workplace chemicals.

A **carcinogen** is a substance that causes cancer.

The **CAS number** is assigned by the Chemical Abstracts Service to identify a specific chemical.

A **combustible** substance is a solid, liquid or gas that will burn.

A **corrosive** substance is a gas, liquid or solid that causes irreversible damage to human tissue or containers.

DEP is the New Jersey Department of Environmental Protection.

DOT is the Department of Transportation, the federal agency that regulates the transportation of chemicals.

EPA is the Environmental Protection Agency, the federal agency responsible for regulating environmental hazards.

A **fetus** is an unborn human or animal.

A **flammable** substance is a solid, liquid, vapor or gas that will ignite easily and burn rapidly.

The **flash point** is the temperature at which a liquid or solid gives off vapor that can form a flammable mixture with air.

HHAG is the Human Health Assessment Group of the federal EPA.

IARC is the International Agency for Research on Cancer, a scientific group that classifies chemicals according to their cancer-causing potential.

A **miscible** substance is a liquid or gas that will evenly dissolve in another.

mg/m^3 means milligrams of a chemical in a cubic meter of air. It is a measure of concentration (weight/volume).

A **mutagen** is a substance that causes mutations. A **mutation** is a change in the genetic material in a body cell. Mutations can lead to birth defects, miscarriages, or cancer.

NAERG is the North American Emergency Response Guidebook. It was jointly developed by Transport Canada, the United States Department of Transportation and the Secretariat of Communications and Transportation of Mexico. It is a guide for first responders to quickly identify the specific or generic hazards of material involved in a transportation incident, and to protect themselves and the general public during the initial response phase of the incident.

NCI is the National Cancer Institute, a federal agency that determines the cancer-causing potential of chemicals.

NFPA is the National Fire Protection Association. It classifies substances according to their fire and explosion hazard.

NIOSH is the National Institute for Occupational Safety and Health. It tests equipment, evaluates and approves respirators, conducts studies of workplace hazards, and proposes standards to OSHA.

NTP is the National Toxicology Program which tests chemicals and reviews evidence for cancer.

OSHA is the Occupational Safety and Health Administration, which adopts and enforces health and safety standards.

PEL is the Permissible Exposure Limit which is enforceable by the Occupational Safety and Health Administration.

PIH is a DOT designation for chemicals which are Poison Inhalation Hazards.

ppm means parts of a substance per million parts of air. It is a measure of concentration by volume in air.

A **reactive** substance is a solid, liquid or gas that releases energy under certain conditions.

A **teratogen** is a substance that causes birth defects by damaging the fetus.

TLV is the Threshold Limit Value, the workplace exposure limit recommended by ACGIH.

The **vapor pressure** is a measure of how readily a liquid or a solid mixes with air at its surface. A higher vapor pressure indicates a higher concentration of the substance in air and therefore increases the likelihood of breathing it in.

>>>>>>>>>>>>>>>>>> EMERGENCY INFORMATION <<<<<<<<<<<<<<<<<<

Common Name: **TETRACHLOROETHYLENE**
DOT Number: **UN 1897**
NAERG Code: **160**
CAS Number: **127-18-4**

Hazard rating	NJDHSS	NFPA
FLAMMABILITY	-	0
REACTIVITY	-	0
CARCINOGEN POISONOUS GASES ARE PRODUCED IN FIRE CONTAINERS MAY EXPLODE IN FIRE		

Hazard Rating Key: 0=minimal; 1=slight; 2=moderate; 3=serious; 4=severe

FIRE HAZARDS

* Extinguish fire using an agent suitable for type of surrounding fire. **Tetrachloroethylene** itself does not burn.
* POISONOUS GASES ARE PRODUCED IN FIRE, including *Hydrogen Chloride* and *Phosgene*.
* CONTAINERS MAY EXPLODE IN FIRE.
* Use water spray to keep fire-exposed containers cool.
* If employees are expected to fight fires, they must be trained and equipped as stated in OSHA 1910.156.

SPILLS AND EMERGENCIES

If **Tetrachloroethylene** is spilled or leaked, take the following steps:

* Evacuate persons not wearing protective equipment from area of spill or leak until clean-up is complete.
* Absorb liquids in vermiculite, dry sand, earth, or a similar material and deposit in sealed containers.
* Ventilate and wash area after clean-up is complete.
* It may be necessary to contain and dispose of **Tetrachloroethylene** as a HAZARDOUS WASTE. Contact your state Department of Environmental Protection (DEP) or your regional office of the federal Environmental Protection Agency (EPA) for specific recommendations.
* If employees are required to clean-up spills, they must be properly trained and equipped. OSHA 1910.120(q) may be applicable.

FOR LARGE SPILLS AND FIRES immediately call your fire department. You can request emergency information from the following:

CHEMTREC: (800) 424-9300
NJDEP HOTLINE: 1-877-WARN-DEP

HANDLING AND STORAGE

* Prior to working with **Tetrachloroethylene** you should be trained on its proper handling and storage.
* **Tetrachloroethylene** *is not compatible with OXIDIZING* AGENTS (such as PERCHLORATES, PEROXIDES, PERMANGANATES, CHLORATES, NITRATES, CHLORINE, BROMINE and FLUORINE); CHEMICALLY ACTIVE METALS (such as POTASSIUM, SODIUM, MAGNESIUM and ZINC); STRONG BASES (such as SODIUM HYDROXIDE and POTASSIUM HYDROXIDE); LITHIUM; BERYLLIUM; and BARIUM.
* Store in tightly closed containers in a cool, well-ventilated area away from HEAT.

FIRST AID

For POISON INFORMATION call 1-800-222-1222

Eye Contact

* Immediately flush with large amounts of water for at least 15 minutes, occasionally lifting upper and lower lids. Seek medical attention.

Skin Contact

* Quickly remove contaminated clothing. Immediately wash area with large amounts of soap and water. Seek medical attention.

Breathing

* Remove the person from exposure.
* Begin rescue breathing (using universal precautions) if breathing has stopped and CPR if heart action has stopped.
* Transfer promptly to a medical facility.
* Medical observation is recommended for 24 to 48 hours after breathing overexposure, as pulmonary edema may be delayed.

PHYSICAL DATA

Vapor Pressure: 14 mm Hg at 68°F (20°C)
Water Solubility: Insoluble

OTHER COMMONLY USED NAMES

Chemical Name:
Ethene, Tetrachloro-
Other Names:
Perchloroethylene; PERC; Ethylene Tetrachloride

Not intended to be copied and sold for commercial purposes.

NEW JERSEY DEPARTMENT OF HEALTH AND SENIOR SERVICES
Right to Know Program
PO Box 368, Trenton, NJ 08625-0368
(609) 984-2202
H5027

Attachment D

Client-Specific Health and Safety Guidelines

Attachment E

Health and Safety Plan Supplements

ATTACHMENT C

Attachment C

Quality Assurance Project Plan

FINAL
QUALITY ASSURANCE PROJECT PLAN
FOR INDOOR AIR SAMPLING AND MITIGATION

BEHR VOC PLUME SITE
Dayton, Ohio

Prepared for:

USEPA REGION 5
26 West Martin Luther King Drive
Cincinnati, OH 45268

Prepared by:

DaimlerChrysler Corporation
800 Chrysler Drive
Auburn Hills, MI 48326

DECEMBER 2006

QUALITY ASSURANCE PROJECT PLAN FOR INDOOR AIR SAMPLING AND MITIGATION BEHR VOC PLUME SITE Dayton, Ohio

DAIMLERCHRYSLER CORPORATION

December 2006

APPROVED BY:

DaimlerChrysler Corporation Project Manager

DaimlerChrysler Corporation Project QA/QC Manager

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LIST OF ABBREVIATIONS AND ACRONYMS I ONLY TOOK OUT A FEW, THIS NEEDS TO MATCH THE DOCUMENT, NOT A GENERAL LIST

BS	Blank Spike
BSD	Blank Spike Duplicate
CoC	Chain-of-Custody
CL	Control Limit
DOT	Department of Transportation
DQO	Data Quality Objective
GC	Gas Chromatography
GC/MS	Gas Chromatography/mass spectrometry
ICP	Inductively coupled plasma atomic emission spectrometry
ICS	Interference Check Sample
ICV	Initial Calibration Verification
IDL	Instrument Detection Limit
kg	kilogram
L	liter
LCL	Lower Control Limit
LCS	Laboratory Control Sample
LCSD	Laboratory Control Sample Duplicate
MCL	Maximum Contaminant Level
mg	milligram
mL	milliliter
MS	Matrix Spike
MSD	Matrix Spike Duplicate
NA	Not Available
NCR	Nonconformance Report
ppb	parts per billion
ppm	parts per million
PTFE	polytetrafluoroethylene (Teflon®)
QA	Quality Assurance
QAPP	Quality Assurance Project Plan
QC	Quality Control
RCRA	Resource Conservation and Recovery Act
RF	Response Factor
RL	Reporting Limit
RPD	Relative Percent Difference
RPO	Remedial Process Optimization Report
RRF	Relative Response Factor
RRT	Relative Retention Time
RSD	Relative Standard Deviation

RSDO	Remedial System Design and Operation
RT	Retention Time
SOP	Standard Operating Procedure
SVOC	Semivolatile Organic Compound
TDL	Target Detection Limit
UCL	Upper Control Limit
USEPA	United States Environmental Protection Agency
VOC	Volatile Organic Compound
°C	Degrees Celsius
HCL	Hydrochloric Acid
HNO_3	Nitric Acid
ug	microgram
<	Less than
≤	Less than or equal to
≥	Greater than or equal to
±	Plus or minus
%R	Percent Recovery

1 INTRODUCTION

This Quality Assurance Project Plan (QAPP) was prepared according to the United States Environmental Protection Agency's (USEPA) guidance and requirements for preparing QAPPs (USEPA, 2000, USEPA, 2001) in support of the Phase I Work Plan for Indoor Air Sampling and Mitigation (Work Plan) at the Behr VOC Plume Site (Site) in Dayton, Ohio.

This QAPP contains quality assurance/quality control (QA/QC) procedures necessary to ensure that analytical data collected in support of the Work Plan is of adequate quality to support the specific project objectives. The Work Plan is a companion document to this QAPP. The laboratory QAPP is a part of this QAPP, and has been included in Attachment 1.

1.1 PROJECT PURPOSE AND OBJECTIVES

To mitigate indoor air impacts at the Site, the U.S. EPA has requested that sub-slab depressurization systems (SSDSs) be installed at properties in the area. Prior to the installation of the systems, indoor air and subsurface slab air samples will be collected independent of the previous U.S. EPA data. The purpose of this project is to collect baseline indoor air and sub-slab air samples from residences surrounding the Site, install appropriate remedial solutions to mitigate elevated concentrations of trichloroethylene (TCE) in indoor air, and follow up with additional indoor air and sub-slab air samples to evaluate and document the effectiveness of the SSDSs. This work will be performed in accordance with the existing Work Plan.

Under the AOC, DaimlerChrysler Corporation has agreed to perform the following activities under the Work Plan:

a) Develop and implement a Site Health and Safety Plan, including an Emergency Contingency Plan.

b) Conduct subsurface gas extent of contamination sampling at the Site utilizing groundwater, soil gas, sub-slab, and/or indoor air sampling techniques.

c) If the applicable Indoor Air Screening Level for TCE is exceeded, design and install interior TCE vapor abatement systems in structures impacted by TCE subsurface migration. Abatement systems may include installation of a sub-slab vapor removal system or crawl space vapor removal system, sealing cracks in walls and floor of the basement, and/or sealing or fixing drains that could be a pathway.

d) Develop and implement a vapor abatement system performance sample plan to confirm that applicable indoor air screening levels are achieved for TCE following installation of the TCE vapor abatement systems. Work will not be completed at any structure until quarterly monitoring (4 continuous quarters) for sub-slab and indoor air is documented less than the applicable screening levels following termination of the installed TCE vapor abatement system operation. The OSC, in his discretion, will determine when the operation of any TCE vapor abatement system can be terminated.

1.2 OVERVIEW OF QAPP

The body of this QAPP is required reading for all project personnel, including field personnel, and is organized as follows:

Section 1.0 Introduction
Section 2.0 Documents and Records
Section 3.0 Sample Handling, Labeling, Shipping, and Custody Requirements
Section 4.0 References

2 DOCUMENTS AND RECORDS

The following sections describe the types of documents and records that will be produced for this project.

2.1 QUALITY ASSURANCE PROJECT PLAN

Earth Tech's project manager shall be responsible for ensuring all project team members, including subcontractors, have reviewed the most current version of this QAPP.

2.2 FIELD DOCUMENTATION

Several forms of field documentation may be used during the course of the air sampling and subsequent SSDS installation, operation and maintenance activities, if necessary. These forms of documentation may include a field logbook for the Site, system installation records, air sampling forms, and COC forms. Forms to be completed during the field activities are included in the Phase I Work Plan.

2.2.1 Field Logbook

A field Logbook shall be maintained for the Site. Entries into the logbook will be made each day that field work is being conducted. Field logbook entries will include, at a minimum, the following items for each day:

- Project identification;
- Field activity subject;
- General work activity;
- Personnel on-site including all Earth Tech and contractor personnel;
- Weather conditions;
- Time and topics of tailgate safety meetings;
- Unusual events;
- Visitors on site;
- Subcontractor progress or problems;
- Communication with the co-workers, laboratory, client or others;
- All sample numbers, and corresponding CoC numbers;
- Results of required calibration and calibration checks;
- Variances from project plans and procedures;
- Photographs taken and identification numbers
- Any problems encountered and their resolutions

2.3 PROJECT REPORTS

A data summary letter will be prepared after each air sampling event by residence, and will summarize sampling results and system operational data (operation time, operating parameters, etc.).

Earth Tech's project manager will be responsible for ensuring that all project reports are reviewed and are as complete and accurate as possible. The specific review process and reviewing personnel will vary based on the report and the technical issues presented in the report.

2.4 CORRECTION TO DOCUMENTATION

If an error (e.g., incorrect date or sample depth) is made on a document, corrections will be made by crossing through the error with a single line so that the original entry can still be read and entering the correct information. All corrections will be initialed and dated.

2.5 PHOTOGRAPHS

Photographs will include documentation of the date and time at which they were taken as well as a brief description of the subject matter. This information will be recorded on the Household Information Form. A copy of this form is included in the Phase I Work Plan.

3 SAMPLE HANDLING, LABELING, SHIPPING, AND CUSTODY REQUIREMENTS

3.1 SAMPLE COLLECTION

Sample collection will be conducted in accordance with the Work Plan.

3.2 SAMPLE CONTAINERS

Sample containers shall be purchased pre-cleaned and treated according to USEPA specifications for the methods. Containers shall be stored in clean areas to prevent exposure to fuels, solvents, and other contaminants.

3.3 SAMPLE VOLUMES, CONTAINER TYPES, AND PRESERVATION REQUIREMENTS

Sample volumes, container types, and preservation requirements by analytical method are listed in the Laboratory QAPP. A copy of the Laboratory QAPP is included as Attachment 1 to this report.

3.4 SAMPLE LABELING AND NUMBERING

All samples, including field QC samples, must be labeled and assigned a unique number.

3.4.1 Sample Labeling

Sample labels are required for properly identifying samples and evidence. All samples (i.e., each sample container) must be properly labeled with the label affixed to the container prior to transportation to analytical laboratories. Information on the sample label should include, but not limited to, the following:

- Project Code: Earth Tech, project number, and site name.
- Sample Identification Number: See Section 3.4.2
- Samplers: Each sampler's name or initials and signature.
- Preservative: Whether a preservative is used and the type of preservative.
- Analysis: The type of analysis requested.
- Date/Time: The date, time, and duration the sample was collected.

3.4.2 Sample Numbering

A sample numbering system is used to uniquely identify each sample (including field QC samples) collected and submitted for analysis. The purpose of the numbering system is to assist in the tracking of samples and facilitate retrieval of analytical results. Sample identification numbers should be used on sample labels, chain-of-custody (CoC) forms, field logbooks, and all other applicable documentation. A summary of the samples collected and corresponding CoC number will be recorded in the field logbook on a daily basis.

All samples will be given a unique identifier. Air samples will have a three-part identifier. The first component will be the sample location identifier (e.g., 1044LEO or 401DANIEL). The second part of the identification will be the type of sample collected. Sample type is either indoor air (IA) or sub-slab soil gas (SG). The third part is a date identifier in the form mmddyy and contains no punctuation. A sample collected from sub-slab location 1044 Leo Street on December 14, 2006 would be identified as 1044LEO-SS-121406. The date and time of sampling will also be listed on the sample container.

3.4.2.1 Field QA/QC Sample Numbering

Sample numbering of the field QA/QC samples (Duplicates, Trip Blanks, Equipment Blanks, and MS/MSD) will be similar to the numbering system used for the samples. Duplicate samples, which are blind to the laboratory, will have a "2" added to the end of the sample location identifier. Therefore, a duplicate sample collected from indoor air location 401 Daniel Street on December 13, 2006 would be identified as 401DANIEL-IA2-121306.

Trip blank samples will be numbered so that the sample results can be easily identified as a trip blank and the samples with which it was shipped can be identified. A three part number system will be used. The first part will identify the sample as a trip blank using the initials TB. The second part of the identification will be the date in the form mmddyy and contain no punctuation. The third portion of the sample number will identify the cooler in which the sample was shipped. Therefore a trip blank sample shipped on December 11, 2006 in cooler number 1 would be labeled TB-121106-C001.

3.5 SAMPLE CHAIN-OF-CUSTODY PROCEDURES

CoC procedures provide documentation of the custody and integrity of the samples beginning at the time of sampling and continuing through transport, sample receipt, preparation, analysis and storage, data generation and reporting, and sample disposal. Records concerning the custody and condition of the samples are maintained in field and laboratory records. Records concerning the cleaning of empty sample containers, container shipment from the laboratory to the site, and security of empty containers at the site should also be maintained.

The CoC record serves as a legal record and shall be maintained for all field and field QC samples. A sample is defined as being under a person's custody if any of the following conditions exist: (1) it is in their possession, (2) it is in their view, after being in their possession, (3) it was in their possession and they locked it up or, (4) it is in a designated secure area.

The laboratory shall maintain an internal sample tracking system.

The following information concerning the sample shall be documented on the CoC form:

- Unique sample identification
- Date and time of sample collection

- Source of sample (including name, location, and sample type)
- Preservative used
- Analyses required
- Name of collector(s)
- Serial numbers of custody seals and transportation cases (if used)
- Bill of lading or transporter tracking number (if applicable)

In addition to the CoC record, there is also a CoC (custody) seal. The CoC seal is an adhesive seal placed in areas such that if a sealed container or cooler is opened, the seal would be broken. The CoC seal ensures that no sample tampering occurred during shipment of samples from the field to the laboratories.

3.5.1 Transfer of Custody and Shipment

All sample shipments and transfers, including shipment or transfer between laboratories, must be accompanied by the CoC record. The CoC record must be signed and dated (with time) by the person (i.e., sampler, sample manager, etc.) relinquishing custody of the samples and the person receiving the samples at the laboratory. A copy of the CoC record should be retained in the field records and the laboratory records.

3.6 SAMPLING HANDLING AND SHIPPING

Samples collected in the field shall be transported to the laboratory as expeditiously as possible. The original CoC record and one copy shall be placed in a plastic bag and secured inside the shipping container (i.e., cooler). A copy of the CoC record shall be retained in the field. The original CoC record shall be transmitted to the project chemist after samples are accepted at the laboratory. This copy shall become part of the project file.

Shipping containers (i.e., coolers) must be secured with strapping tape and custody seals. The custody seals must be placed on the container so that it cannot be opened without breaking the seals. The seal must be signed and dated by the field investigator.

If samples are sent by mail, the containers shall be registered with return receipt requested. If sent by common carrier, an air bill shall be used. Receipts from post offices and air bills shall be retained as part of the CoC documentation. Air bill numbers or registered mail serial numbers shall be recorded in the remarks section of the CoC record.

Sample shipments including methanol preserved samples, hazardous waste samples, radioactive samples, etc. may have special handling and shipping requirements. Check local, state and department of transportation (DOT) regulations and with the carrier regarding shipping of these types of samples.

Table 3-1
Requirements for Containers, Preservation Techniques, Sample Volumes, and Holding Times

Name	Analytical Methods	Containers	Preservation	Maximum Holding Time
Volatile Organic Compounds (VOCs)	TO-15A SIM	*Air*: 6 L Summa™ canisters.	*Air*: None, lab certified clean.	*Air*: 14 days.

4 REFERENCES

United States Environmental Protection Agency (USEPA). 1986. Test Methods for Evaluating Solid Waste, Physical/Chemical Methods, Third Edition, and its first, second, and third updates.

USEPA. January 1999. Compendium of Methods for the Determination of Toxic Organic Compounds in Ambient Air, Second Edition, Compendium Method TO-15: Determination Of Volatile Organic Compounds (VOCs) In Air Collected In Specially-Prepared Canisters And Analyzed By Gas Chromatography/Mass Spectrometry (GC/MS), Center for Environmental Research Information, Office of Research and Development, USEPA, Cincinnati, OH 45268, EPA/625/R-96/010b.

USEPA. 1999. USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review, EPA 540/R-99/008. October.

USEPA. 2000a. Guidance for the Data Quality Objective Process, EPA QA/G-4. August.

USEPA. 2000b. Data Quality Objectives Process for Hazardous Waste Site Investigations, EPA QA/G-4HW. January.

USEPA. 2001. EPA Requirements for Quality Assurance Project Plans, EPA QA/R-5. March.

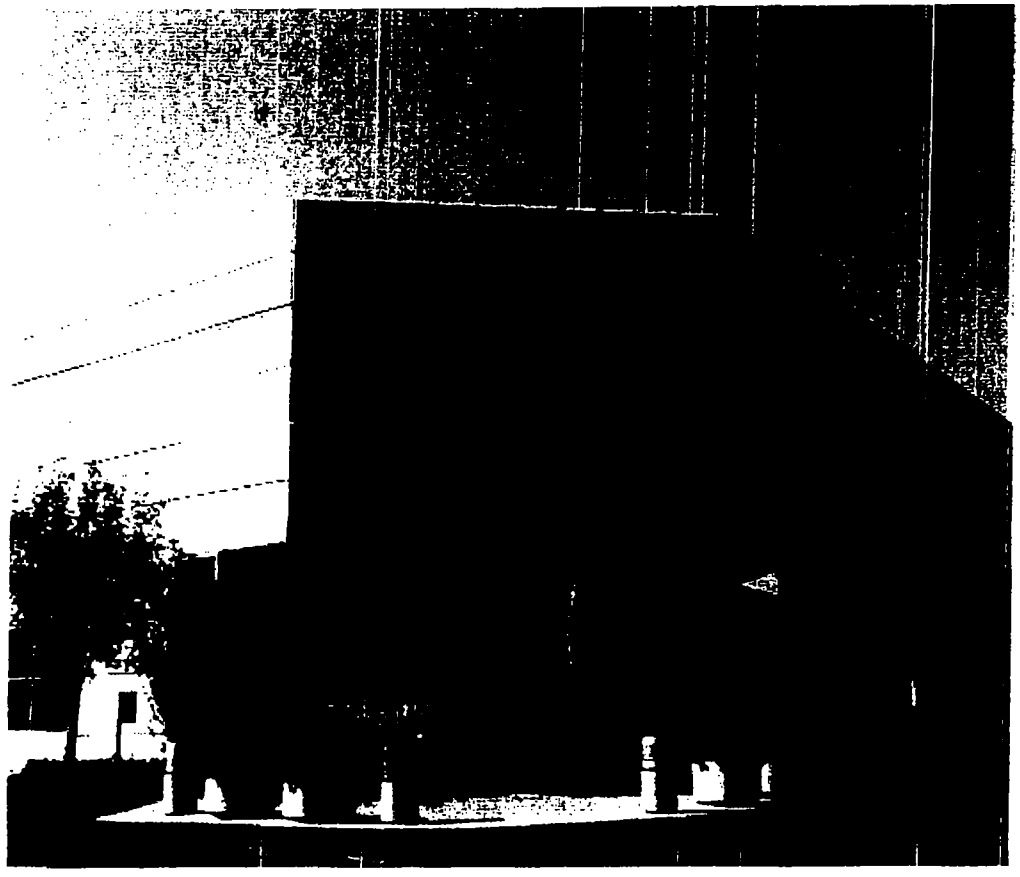
USEPA. 2002. USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review, EPA 540-R-01-008.

USEPA. 2004b. List of Drinking Water Contaminants and MCLs, www.epa/safewater/mcl.html.

ATTACHMENT 1

LABORATORY QAPP

LABORATORY QUALITY MANUAL



REVISION 4
April 1, 2005

STL Los Angeles Laboratory
1721 South Grand Avenue
Santa Ana, California

(714) 258-8610 & (714) 258-0921 FAX

LABORATORY QUALITY MANUAL

REVISION 4

April 1, 2005

Approved By:

3/31/05

Elizabeth Winger **Date**
Laboratory Director & Technical Director

3-31-2005

Maria Friedman **Date**
QA Manager

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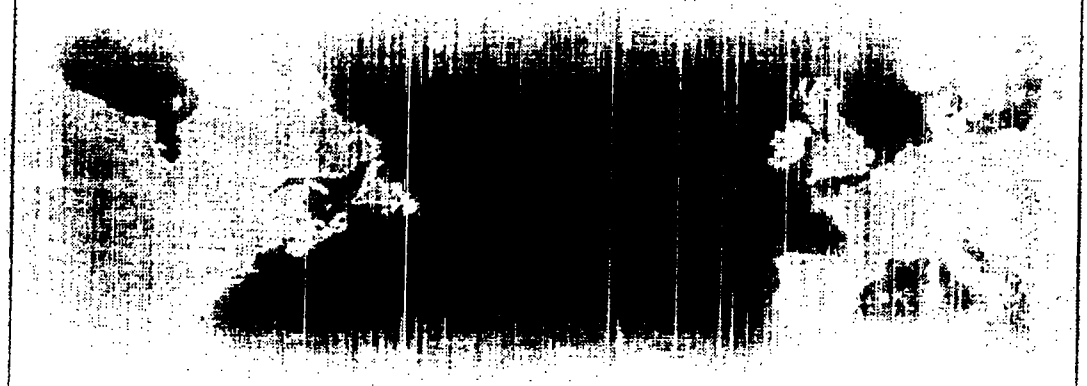
SEVERN TRENT STL

Vision

STL will be the recognized industry leader for environmental analysis.



Mission

Through the innovation and dedication of our people, together with the quality of our systems, we will deliver levels of performance that delight our clients, retain the confidence of our stakeholders and enable the profitable growth of our business.

Severn Trent Laboratories

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1. Introduction, Purpose and Scope

1.1. Company Overview

STL Los Angeles is an integral part of Severn Trent Laboratories, Inc., a national group of 29 laboratory facilities. STL Los Angeles is located in Santa Ana, California and has been doing business in Southern California since 1979 as a full-service environmental testing laboratory. Severn Trent Laboratories, Inc. acquired this facility in February of 2000. The 27,000-square foot laboratory was specifically designed and built to meet the needs of environmental customers and employees.

STL offers a broad range of environmental testing services provided by over two thousand professionals in the US. STL's testing capabilities include chemical, physical, and biological analyses of a variety of matrices, including aqueous, solid, drinking water, waste, tissue, air and saline/estuarine samples. Specialty capabilities include dioxin and furan analysis, air toxics, radiological testing, geotechnical testing, tissue preparation and analysis, aquatic toxicology, asbestos analysis, microscopy services, High Resolution Mass Spectrometry (HRMS), Inductively Coupled Plasma/MS (ICP/MS), Liquid Chromatography/MS (LC/MS), Mycology (mold and fungus), PCR microbiology, and on-site technologies including mobile laboratories. STL facility locations and contact information are outlined in Table 1.

For simplicity sake, from this point forward, STL Los Angeles will be referred to as "STL."

1.2. Quality Assurance Policy

It is STL's policy to:

- Provide high quality, consistent, and objective environmental testing services that meet all federal, state, and municipal regulatory requirements.
- Generate data that are scientifically sound, legally defensible, meet project objectives, and are appropriate for their intended use.
- Provide STL clients with the highest level of professionalism and the best service practices in the industry.
- Build continuous improvement mechanisms into all laboratory, administrative, and managerial activities.
- Maintain a working environment that fosters open communication with both clients and staff and ensures data integrity.

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Table 1. STL Facility Locations in the U.S.

STL Austin
14046 Summit Drive
Suite 111
Austin, TX 78728
Phone: 512-244-0855
Fax: 512-244-0160

STL Billerica
149 Rangeway Road
N. Billerica, MA 01862
Phone: 978-667-1400
Fax: 978-667-7871

STL Buffalo
10 Hazelwood Drive
Suite 106
Amherst, NY 14228
Phone: 716-691-2600
Fax: 716-691-7991

STL Burlington
208 South Park Drive
Suite 1
Colchester, VT 05446
Phone: 802-655-1203
Fax: 802-655-1248

STL Connecticut
128 Long Hill Cross Road
Shelton, CT 06484
Phone: 203-929-8140
Fax: 203-929-8142

STL Chicago
2417 Bond Street
University Park, IL 60466
Phone: 708-534-5200
Fax: 708-534-5211

STL Corpus Christi
1733 N. Padre Island Drive
Corpus Christi, TX 78408
Phone: 361-289-2673
Fax: 361-289-2471

STL Denver
4955 Yarrow Street
Arvada, CO 80002
Phone: 303-421-6611
Fax: 303-431-7171

STL Edison
777 New Durham Road
Edison, NJ 08817
Phone: 732-549-3900
Fax: 732-549-3679

STL Houston
6310 Rothway Drive
Suite 130
Houston, TX 77040
Phone: 713-690-4444
Fax: 713-690-5646

STL Knoxville
5815 Middlebrock Pike
Knoxville, TN 37921
Phone: 865-291-3000
Fax: 865-584-4315

STL Los Angeles
1721 South Grand Avenue
Santa Ana, CA 92705
Phone: 714-258-8610
Fax: 714-258-0921

STL Miami
10200 USA Today Way
Miramar, FL 33025
Phone: 954-431-4550
Fax: 954-431-1959

STL Mobile
900 Lakeside Drive
Mobile, AL 36693
Phone: 334-666-6633
Fax: 334-666-6696

STL Newburgh
315 Fullerton Avenue
Newburgh, NY 12550
Phone: 845-562-0890
Fax: 845-562-0841

STL North Canton
4101 Shuffel Drive NW
North Canton, OH 44720
Phone: 330-497-9396
Fax: 330-497-0772

STL On-Site Technology
Westfield Executive Park
53 Southampton Road
Westfield, MA 01085
Phone: 413-572-4000
Fax: 413-572-3707

STL Pensacola
3355 McLemore Drive
Pensacola, FL 32514
Phone: 850-474-1001
Fax: 850-478-2671

STL P&K
1936 Olney Ave.
Cherry Hill, NJ 08003
Phone: 856-489-4455
Fax: 856-489-4085

STL Pittsburgh
450 William Pitt Way
Building 6
Pittsburgh, PA 15238
Phone: 412-820-8380
Fax: 412-820-2080

STL Richland
2800 George Washington Way
Richland, WA 99352
Phone: 509-375-3131
Fax: 509-375-5590

STL Sacramento
880 Riverside Parkway
West Sacramento, CA 95605
Phone: 916-373-5600
Fax: 916-372-1059

STL San Francisco
1220 Quarry Lane
Pleasanton, CA 94566-4756
Phone: 925-484-1919
Fax: 925-484-1096

STL St. Louis
13715 Rider Trail North
Earth City, MO 63045
Phone: 314-298-8566
Fax: 314-298-8757

STL Savannah
5102 LaRoche Avenue
Savannah, GA 31404
Phone: 912-354-7858
Fax: 912-351-3673

STL Seattle
5755 8th Street East
Tacoma, WA 98424
Phone: 253-922-2310

STL Tallahassee
2846 Industrial Plaza Dr.
Tallahassee, FL 32301
Phone: 850-878-3994
Fax: 850-878-9504

STL Tampa
6712 Benjamin Road
Suite 100
Tampa, FL 33634
Phone: 813-885-7427
Fax: 813-885-7049

STL Valparaiso
2400 Cumberland Drive
Valparaiso, IN 46383
Phone: 219-464-2389
Fax: 219-462-2953

STL Westfield
Westfield Executive Park
53 Southampton Road
Westfield, MA 01085
Phone: 413-572-4000
Fax: 413-572-3707

1.3. Management Commitment to Quality Assurance

STL management is committed to providing the highest quality data and the best service in the environmental testing industry. To ensure that the data produced and reported by STL meet the requirements of its clients and to comply with the letter and spirit of municipal, state and federal regulations, STL maintains a Quality System that is clear, effective, comprehensive, well communicated and supported at all levels in the company.

1.4. Management Commitment to Ethics

Establishing and maintaining a high ethical standard is a critical element of a quality system. In order to ensure that all personnel understand the importance that STL places on maintaining high ethical standards at all times, STL has established an Ethics Policy, including an employee ethics statement. Every employee, upon hire and then annually, receives in-depth Ethics training from the Lab Director and/or QA Department. This training reinforces STL's commitment to a quality. A central tenant of the policy is management's need to consistently convey the message to analysts that financial pressures can never be allowed to compromise the quality of work.

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1.5. Purpose

The purpose of the Laboratory Quality Manual (LQM) is to describe the STL Quality System and to outline how that system enables all employees of STL to meet the Quality Assurance (QA) policy. The LQM is based on the policies and practices descried in the Corporate Quality Management Plan (QMP). The LQM also describes specific QA activities and requirements and prescribes their frequencies. This LQM formalizes the quality system that has been established and is in operation for all sample related and data production activities including sample handling, receipt, preparation, analysis, reporting, and documentation. Roles and responsibilities of management and laboratory staff in support of the Quality System are also defined in the LQM.

1.6. Scope

This LQM applies to all associates of the STL laboratory. There is a firm commitment from all members of the laboratory to follow a comprehensive LQM. This commitment and dedication to quality is fully supported from technician to chemist to upper management in order to meet the objectives of our analytical laboratory.

This LQM undergoes an annual review by the QA Manager, the Laboratory Director and the Technical/Deputy Technical Directors. Revisions to the LQM are distributed throughout the laboratory to replace the out-dated copies so that only the most current revision is in use. It is the joint responsibility of the QA manager, the Laboratory Director, the Technical Directors and Laboratory Department Managers to ensure that all associates familiarize themselves with, and comply with, the procedures laid out in this manual and associated supporting documentation.

STL has the responsibility and authority to operate in compliance with documented client requirements, where they do not conflict with regulatory requirements. STL shall not enter any client agreements that conflict with regulatory requirements in the jurisdiction in which the work is performed. Where documented client agreements conflict with this LQM but meet the regulatory requirements of the jurisdiction in which the work is performed, the client agreements shall supersede requirements in this LQM.

The policies and practices of quality assurance/quality control presented in this manual and the Corporate Quality Management Plan (QMP) for all STL facilities are set forth as minimums. Where this document uses the terms "must" and "shall", this denotes required activities.

STL operates under the regulations and guidelines of the following federal programs:

- National Environmental Laboratory Accreditation Conference (NELAC)
- Resource Conservation and Recovery Act (RCRA)
- Clean Air Act (CAA)
- Clean Water Act (CWA)
- Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA)
- National Pollution, Discharge, and Elimination System (NPDES)
- Safe Drinking Water Act (SDWA)

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- Air Force Center for Environmental Excellence (AFCEE)
- US Army Corp of Engineers, Hazardous, Toxic and Radioactive Waste (USACE)
- Navy Facilities Engineering Service Center (NFESC)
- Department of Defense Quality Systems Manual (DOD QSM)
- ISO/IEC Guide 25

STL also provides analytical services under various state and local municipal guidelines. A current list of analytical methodologies is provided in Appendix A and laboratory certifications and accreditations can be found in Appendix B.

This LQM was written to comply with the National Environmental Laboratory Accreditation Conference (NELAC) standards. Refer to Table 2 for a cross-reference comparison of this LQM to the NELAC Standards.

Table 2: Correlation of LQM Sections with NELAC Quality Manual Requirements

NELAC Chapter 5.5.2 Quality Manual	Quality Management Plan Section
a. Quality policy statement, including objectives and commitments	1.2 Quality Assurance Policy 4.2.1 Objectives of the Quality System
b. Organization and management structure	4.1 Organization and Management
c. Relationship between management, technical operations, support services and the quality systems	4.1.2 Roles and Responsibilities 4.2 Quality System
d. Records retention procedures; document control procedures	4.3 Document Control 4.12.2 Record Retention
e. Job descriptions of key staff and references to job descriptions of other staff	4.1.2 Roles and Responsibilities
f. Identification of laboratory approved signatories	4.1 Organization and Management
g. Procedures for achieving traceability of measurements	5.5 Measurement Traceability
h. List of all test methods under which the laboratory performs its accredited testing	5.3.1 Method Selection Appendix A – Methods list
i. Mechanisms for assuring the laboratory reviews all new work to ensure that it has the appropriate facilities and resources before commencing such work	4.4.2 Project-Specific Quality Planning
j. Reference to the calibration and/or verification test procedures used	5.4.3 Equipment Verification and Calibration
k. Procedures for handling submitted samples	4.7.1 Sample Acceptance Policy 5.7 Sample Handling, Transport and Storage
l. Reference to the major equipment and reference measurement standards used as well as the facilities and services used in conducting tests	5.4.2 Equipment Maintenance 5.4.3 Equipment Verification and Calibration Table 12 Equipment Maintenance Schedules
m. Reference to procedures for calibration, verification and maintenance of equipment	5.4.2 Equipment Maintenance 5.4.3. Equipment Verification and Calibration Table 12 Equipment Maintenance Schedules

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Table 2: Correlation of LQM Sections with NELAC Quality Manual Requirements

NELAC Chapter 5.5.2 Quality Manual	Quality Management Plan Section
n. Reference to verification practices including inter-laboratory comparisons, PT/PE programs, use of reference materials and internal QC schemes	5.8.1 Proficiency Testing 5.8.2 Control Samples
o. Procedures for feedback and corrective action whenever testing discrepancies are detected, or departures from documented procedures occur	4.9 Control of Non-Conformances 4.10 Corrective Action 4.11 Preventive Action 5.8.5 Permitting Departures from Documented Procedures
p. Laboratory management arrangements for exceptionally permitting departures from documented policies and procedures	4.4.2 Project-Specific Quality Planning 5.8.5 Permitting Departures from Documented Procedures
q. Procedures for dealing with complaints	4.8 Complaints
r. Procedures for protecting confidentiality and proprietary rights	4.7.2 Client Confidentiality and Proprietary Rights
s. Procedures for audits and data review	4.13 Internal Audits 4.14 External Audits 5.3.6 Data Review
t. Process/procedures for establishing that personnel are adequately experienced in duties they are expected to carry out and are receiving any needed training	5.1.2 Training
u. Ethics policy statement developed by the laboratory and training personnel in their ethical & legal responsibilities	5.1.4 Ethics Policy
v. Reference to procedures for reporting analytical results	5.3.6 Data Review 5.9 Project Reports
w. Table of contents, listing reference, glossaries and appendices	TOC Table of Contents Appendix I: List of Cited SOPs

2. References

The following references were used in preparation of this document and as the basis of the STL Quality System:

Severn Trent Laboratories Quality Management Plan, Revision 6, October 2003

National Environmental Laboratory Accreditation Conference, Constitution, Bylaws, and Standards, EPA600/R-98/151, USEPA Office of Research and Development, July 2001.

EPA Requirements For Quality Management Plans, EPA QA/R-2, United States Environmental Protection Agency Management Staff, Washington, DC, Draft Interim Final, August 1994.

General Requirements for the Competence of Testing and Calibration Laboratories. ISO/DIS 17025.

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EPA Quality Manual for Environmental Programs, 5360, USEPA Office of Research and Development, National Center for Environmental Research and Quality Assurance, Quality Assurance Division, July, 1998.

General Requirements for the Competence of Calibration and Testing Laboratories, ISO/IEC Guide 25, 1990.

Good Automated Laboratory Practices, EPA 2185, 1995.

Quality Assurance Project Plan, HQ Air Force Center for Environmental Excellence, Ver 3.1, August 2001.

Navy Installation Restoration Chemical Data Quality Manual (IR CDQM), Department of the Navy, Naval Facilities Engineering Service Center, October 1999.

Department of Defense – Quality Systems Manual for Environmental Laboratories, DoD Environmental Data Quality Workgroup Department of Navy, Lead Service, Ver 2, June 2002.

Shell for Analytical Chemistry Requirements, US Army Corps of Engineers, December 1998.

3. Terms and Definitions

Accuracy: *the degree of agreement between an observed value and an accepted reference value.*

Audit: a systematic evaluation to determine the conformance to specifications of an operational function or activity.

Batch: environmental samples plus associated QC samples, which are prepared and/or analyzed together with the same process, using the same lot(s) of reagents. A preparation (QC) batch is composed of one to 20 environmental samples of the same matrix, meeting the above-mentioned criteria. An analytical batch is composed of prepared environmental samples, extracts, digestates or concentrates that are analyzed together as a group. An analytical batch can include prepared samples originating from various environmental matrices and can exceed 20 samples.

Chain of Custody (COC): an unbroken trail of accountability that ensures the physical security of samples, data and records.

Clean Air Act: legislation in 42 U.S.C. 7401 et seq., Public Law 91-604, 84 Stat. 1676 Pub. L. 95-95, 91 Stat., 685 and Pub. L. 95-190, 91 Stat., 1399, as amended.

Comprehensive Environmental Response, Compensation and Liability Act (CERCLA/Superfund): legislation (42 U.S.C. 9601-9675 et seq., as amended by the Superfund Amendments and reauthorization Act of 1986 (SARA), 42 U.S.C. 9601et seq.

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Compromised Sample: a sample received in a condition that jeopardizes the integrity of the results. See Section 4.7.1 for a description of these conditions.

Confidential Business Information (CBI): information that an organization designates as having the potential of providing a competitor with inappropriate insight into its management, operation or products.

Confirmation: verification of the presence of a component using an additional analytical technique. These may include second column confirmation, alternate wavelength, derivatization, mass spectral interpretation, alternative detectors, or additional cleanup procedures.

Controlled document: A document for which the distribution is known. Updates of the document are sent to the original recipients, unless the copy distributed is an uncontrolled copy.

Corrective Action: measure taken to eliminate the causes of an existing non-conformance, defect or other undesirable situation in order to prevent recurrence.

Data Audit: a qualitative and quantitative evaluation of the documentation and procedures associated with environmental measurements to verify that the resulting data are of acceptable quality.

Demonstration of Capability (DOC): procedure to establish the ability to generate acceptable accuracy and precision.

Equipment Blank: a portion of the final rinse water used after decontamination of field equipment; also referred to as Rinsate Blank and Equipment Rinsate.

Document Control: the act of ensuring that documents (and revisions thereto) are proposed, reviewed for accuracy, approved for release by authorized personnel, distributed properly and controlled to ensure use of the correct version at the location where the prescribed activity is performed.

Federal Insecticide, Fungicide and Rodenticide Act (FIFRA): legislation under 7 U.S.C. 135 et seq., as amended

Federal Water Pollution Control Act (Clean Water Act, CWA): legislation under 33 U.S.C. 1251 et seq., Public Law 92-50086 Stat. 816.

Field Blank: a blank matrix brought to the field and exposed to field environmental conditions.

Field of Testing / Field of Accreditation (FOT / FOA): A field of testing or analysis that is based upon on NELAC's categorization of accreditation – based on Program, Matrix and analyte.

Good Laboratory Practices (GLP): formal regulations for performing basic laboratory operations outlined in 40 CFR Part 160 and 40 CFR Part 729 and required for activities performed under FIFRA and TSCA.

Holding Time: the maximum time that a sample may be held before preparation and/or analysis and still be considered valid as promulgated in the method.

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Holding / Storage Blank: a blank matrix stored with field samples of a similar matrix.

Instrument Blank: a blank matrix that is the same as the processed sample matrix (i.e. extract, digestate, condensate) and introduced onto the instrument for analysis.

Internal Chain of Custody (ICOC): an unbroken trail of accountability that ensures the physical security of samples, data and records. Internal Chain of Custody refers to additional documentation procedures implemented within the laboratory that includes special sample storage requirements, and documentation of all signatures and/or initials, dates, and times of personnel handling specific samples or sample aliquots

Instrument Detection Limit (IDL): the minimum amount of a substance that can be measured with a specified degree of confidence that the amount is greater than zero using a specific instrument. The IDL is associated with the instrumental portion of a specific method only, and sample preparation steps are not considered in its derivation. The IDL is a statistical estimation at a specified confidence interval of the concentration at which the relative uncertainty is +100%. The IDL represents a range where qualitative detection occurs on a specific instrument. Quantitative results are not produced in this range.

Laboratory Control Sample (LCS): a blank matrix spiked with a known amount of analyte(s), processed simultaneously with, and under the same conditions as, samples through all steps of the analytical procedure.

Laboratory Quality Manual (LQM): a document stating the quality policy, quality system and quality practices of the laboratory. The LQM may include by reference other documentation relating to the laboratory's quality system.

Limit of Detection (LOD): the minimum amount of a substance that an analytical process can reliably detect.

LIMS: Laboratory's data management system.

Matrix: The substrate of a test sample. For purposes of batch and QC requirements determination, the matrix descriptions in Table 3 are used.

Matrix Duplicate (MD): duplicate aliquot of a sample processed and analyzed independently; under the same laboratory conditions; also referred to as Sample Duplicate.

Matrix Spike (MS): field sample to which a known amount of target analyte(s) is added.

Matrix Spike Duplicate (MSD): a replicate matrix spike.

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Table 3. Sample Matrix Descriptions

Matrix	Description
Air	Air samples as analyzed directly or as adsorbed into a solution or absorption matrix and desorbed.
Aqueous (water)	Aqueous sample excluded from the definition of Drinking Water or Saline/Estuarine source. Includes surface water, groundwater and effluents.
Solid	Soil, sediment, sludge or other matrices with ≥15% settleable solids.
Waste	A product or by-product of an industrial process that results in a matrix not previously defined.
Biological / Tissue	Sample of a biological origin such as fish tissue, shellfish, or plant material. Such samples shall be grouped according to origin.

Method Blank: a blank matrix processed simultaneously with, and under the same conditions as samples, through all steps of the analytical procedure.

Method Detection Limit (MDL): the minimum concentration of a substance (an analyte) that can be measured with 99% confidence that the analyte concentration is greater than zero and determined from analysis of sample in a given matrix containing the analyte. (40 CFR Part 136 Appendix B).

Nonconformance: an indication, judgement, or state of not having met the requirements of the relevant specifications, contract, or regulation.

Precision: the degree to which a set of observations or measurements of the same property, usually obtained under similar conditions, conform to themselves; a data quality indicator.

Preservation: refrigeration and or reagents added at the time of sample collection to maintain the chemical and or biological integrity of the sample.

Proficiency Testing (PT): determination of the laboratory calibration or testing performance by means of inter-laboratory comparisons.

Proficiency Test (PT) Sample: a sample, the composition of which is unknown to the analyst, that is provided to test whether the analyst/laboratory can produce analytical results within specified limits.

Proprietary: belonging to a private person or company.

Trip Blank: a blank matrix placed in a sealed container at the laboratory that is shipped and held unopened in the field and returned to the laboratory in the shipping container with the field samples.

Quality Assurance (QA): an integrated system of activities involving planning, quality control, quality assessment, reporting and quality improvement to ensure that a product or service meets defined standards of quality with a stated level of confidence.

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Quality Assurance Project Plan (QAPP): a formal document describing the detailed quality control procedures by which the quality requirements defined for the data and decisions pertaining to a specific project are to be achieved.

Quality Control (QC): the overall system of technical activities whose purpose is to measure and control the quality of a product or service so that it meets the needs of users.

Quality Control Sample: an uncontaminated sample matrix spiked with a known amount(s) of an analyte(s) from a source independent of the calibration standards. It is used to establish intra-laboratory or analyst specific precision and bias or to assess the performance of all or a portion of the measurement system.

Quality Management Plan (QMP): a formal document describing the management policies, objectives, principles, organizational authority, responsibilities, accountability, and implementation plan of an agency, organization or laboratory, to ensure the quality of its product and the utility of the product to its users.

Quality System: a structured and documented management system describing the policies, objectives, principles, organizational authority, responsibilities, accountability, and implementation plan of an organization for ensuring quality in its work processes, products (items), and services. The quality system provides the framework for planning, implementing, and assessing work performed by the organization and for carrying out required QA/QC.

Quantitation Limit (QL): the minimum amount of a substance that can be quantitatively measured with a specified degree of confidence and within the accuracy and precision guidelines of a specific measurement system. The QL can be based on the MDL, and is generally calculated as 3-5 times the MDL, however, there are analytical techniques and methods where this relationship is not applicable. Also referred to as Practical Quantitation Level (PQL), Estimated Quantitation Level (EQL), Limit of Quantitation (LOQ).

Raw Data: any original information from a measurement activity or study recorded in a laboratory notebook, worksheets, records, memoranda, notes, or exact copies thereof and that are necessary for the reconstruction and evaluation of the report of the activity or study. Raw data may include photography, microfilm or microfiche copies, computer printouts, magnetic media, including dictated observations, and recorded data from automated instruments.

Record Retention: the systematic collection, indexing and storing of documented information under secure conditions.

Reference Standard: a standard, generally of the highest metrological quality available at a given location, from which measurements made at that location are derived.

Reporting Limit: The Reporting Limit is based upon an evaluation of the PQL's / MDL's and the expected method performance in routine soil and water matrices

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Resource Conservation and Recovery Act (RCRA): legislation under 42 USC 321 et seq. (1976).

Safe Drinking Water Act (SDWA): legislation under 42 USC 300f et seq. (1974), (Public Law 93-523).

Sampling and Analysis Plan (SAP): a formal document describing the detailed sampling and analysis procedures for a specific project.

Selectivity: The capability of a method or instrument to respond to a target substance or constituent in the presence of non-target substances.

Sensitivity: the capability of a method or instrument to discriminate between measurement responses representing different levels (e.g., concentrations) of a variable of interest.

Spike: a known amount of an analyte added to a blank, sample or sub-sample.

Standard Operating Procedure (SOP): a written document which details the method of an operation, analysis or action whose techniques and procedures are thoroughly prescribed and which is accepted as the method for performing certain routine or repetitive tasks.

Systems Audit: a thorough, systematic, on-site, qualitative review of the facilities, equipment, personnel, training, procedures, record keeping, data validation, data management, and reporting aspects of a total measurement system.

Test Method: defined technical procedure for performing a test.

Toxic Substances Control Act (TSCA): legislation under 15 USC 2601 et seq., (1976).

Traceability: the property of a result of a measurement that can be related to appropriate international or national standards through an unbroken chain of comparisons.

Trip Blank: a blank matrix placed in a sealed container at the laboratory that is shipped, held unopened in the field, and returned to the laboratory in the shipping container with the field samples.

Validation: The process of a second party performing a systematic review of the raw and final data produced by a laboratory using predetermined criteria to ascertain the validity of the data with respect to the criteria.

Vendor: Any individual or organization furnishing items or services or performing work according to a procurement document. This term is used in place of supplier, seller, contractor, subcontractor, or consultant.

Verification: confirmation by examination and provision of evidence that specified requirements have been met.

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4. Management Requirements

4.1. Organization and Management

4.1.1. Organization

STL organizational structure and essential personnel are presented in Figure 1 and Table 4. A QA Manager, who is independent and has no operational responsibilities, is designated at the STL facility. The facility QA Manager has an indirect reporting relationship to the Corporate QA Manager. The facility is under the supervision of a Laboratory Director who reports to the General Manager who in return reports to the Environmental Chief Operational Officer (COO).

It is the policy of the laboratory that at each management and operational level a designated deputy or deputies are assigned. These deputies maintain continuity of service and other functions in case of the absence of key staff. The Laboratory Director ensures that all staff are made aware of their respective designated deputies and that they are fully aware of extent and limitations of their responsibility.

The QA Manager operates independently of the laboratory sections generating data. In this way, objectivity in the evaluation of laboratory operations is obtained. The laboratory structure provides a means for communication from the technician, analyst, chemist up to the General Manager. This organizational structure facilitates the generation of data, several levels of data review, and the monitoring of the overall quality of the data produced in the laboratory before it is reported to the client. Résumé's of key staff, experience and educational profiles for these staff members are located in Appendix 'A' and are available upon request.

4.1.2. Roles and Responsibilities

Each section within the laboratory has specific roles and responsibilities in terms of producing a product of known quality. All laboratory personnel are expected to have a working knowledge of the LQM. A copy of the most recent LQM is available to each laboratory section and quality management training is periodically performed for new laboratory associates. It is expected that associates at every level ensure that data are generated in compliance with this LQM. The responsibilities of certain essential positions are detailed below.

4.1.2.1. The General Manager is directly and ultimately responsible for ensuring data quality and providing operational direction at STL. Responsibilities include:

- Development of policies and quality assurance strategies in collaboration with the Laboratory Directory and Laboratory Department Managers.
- Allocate personnel and resources throughout the laboratory section.
- Long term planning, setting goals, and achieving the financial business and quality objectives of STL.
- Oversee the efforts of laboratory marketing and sales.
- Review monthly management reports and quality assurance reports.

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4.1.2.2. The Laboratory Director reports to the General Manager and is responsible for all aspects of laboratory operations to ensure timely completion of all contractual obligations. Responsibilities include:

- Monitor the progress of sample preparation and analysis.
- Supervision of staff, setting goals and objectives for both the business and the employees, and achieving the financial, business, and quality objectives of the facility.
- Establish the priority of sample analysis in order to meet QA and client deadlines.
- Maintain well-versed technical understanding of analytical methodology for the evaluation of laboratory operations, development of procedural improvements, investigation of non-compliant results and implementation of corrective action.
- Review Standard Operations Procedures and ensure conformance to those procedures.
- Communicate resource needs to management.

4.1.2.3. The QA Manager reports directly to the Laboratory Director and, for all QA matters, to the Corporate QA Manager to maintain independence of QA oversight. Responsibilities include:

- Has the final authority for to accept or reject data and to stop work in progress in the event that procedures or practices compromise the validity or integrity of analytical data.
- Maintains, approves, and implements the LQM.
- Directs controlled distribution of laboratory quality documents.
- Provides quality system, including ethics and client confidentiality, training to all employees.
- Reviews and approves documentation of analyst training records.
- Conduct internal system and data audits to monitor laboratory compliance with the LQM and SOP's.
- Provide assistance in the development and approval of laboratory management documents including SOP's as well as the control, revision and distribution thereof.
- Identify areas where corrective action is required and then ensure implementation and completion of the resulting action.
- Oversee laboratory participation in performance evaluation programs and regulatory certification and accreditation programs.
- Notify laboratory management of deficiencies in the quality system and prepare monthly report to management.
- Act as point of contact regarding QA matters for the laboratory, including external audits.

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4.1.2.4. The Technical Director and Deputy Technical Director report directly to the Laboratory Director. They are responsible for the maintenance of accurate SOP's and the enforcement of the LQM. Responsibilities include:

- Execute and supervise analytical procedures according to approved methodology.
- Manage laboratory operations; work scheduling, sample tracking, prompt reporting of results.
- Perform periodic secondary review of raw data for accuracy and completeness, check calibrations and calculations and reconcile any non-compliant data.
- Supervise and train staffs, set goals and objectives for the employees, and achieve the quality objectives of the facility.
- Monitor the validity of the analyses performed and data generated in the laboratory to assure reliable data.
- Determine qualifications required for technical positions and evaluate job candidates against those requirements.
- Certify technical laboratory personnel based on education and background to ensure that employees have demonstrated capability in the activities for which they are responsible.

4.1.2.5. Customer Service Manager reports directly to the Laboratory Director. Responsibilities include:

- Oversee all non-operational areas of the laboratory.
- Works with the QA department and the department managers to ensure the requirements of projects are met in a timely manner.
- Has signature authority on laboratory reports.
- Defines customer requirements through project definition.
- Assess and assures that the resources are available to ensure customer satisfaction.
- Provides feedback to management on changing customer needs

4.1.2.6. Project Managers are instrumental in assisting both the laboratory and the client during the course of a project. Responsibilities include:

- Coordination of laboratory services directly with clients.
- Understanding contractual requirements and effectively communicating client needs to laboratory personnel.
- Notification of clients regarding specific non-conformance, changes or difficulties encountered within the laboratory.
- Investigation of problems with samples and containers received from the field.
- Monitoring of analytical work progress.
- Completeness review all reports generated for the project.
- Report approval signatory as designated by the Laboratory Director.

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4.1.2.7. The Laboratory Department Managers report directly to the Laboratory Director. They are responsible for the daily activities of analyses and maintenance of SOP's within the group. Responsibilities include:

- Supervises the daily activities of analyses, bench level chemists or data review within the group.
- Manage the groups laboratory operations including; work scheduling, sample tracking and prompt reporting of results.
- Perform technical secondary review of raw data for accuracy and completeness, check calibrations and calculations and reconcile any non-compliant data.
- Accept or reject data based on compliance with established quality control criteria.
- Conduct self-assessments for conformance with laboratory policies and procedures.
- Ensure that all instrumentation and equipment meet performance criteria and calibration requirements. Schedules instrument repairs.
- Supervise and train staff, set goals and objectives for the employees to achieve the quality objectives of their section.

4.1.2.8. Chemist level, laboratory analysts are responsible for the generation of data by analyzing samples according to written SOP's and client requirements. Responsibilities include:

- Understand the requirements in LQM and the SOP's associated with their specific function.
- Ensure that all steps related to sample analysis are documented with integrity, completely and accurately.
- Perform initial technical review of sample preparation information, calculations, qualitative identifications and raw data with the authority to stop, accept or reject data based on compliance with well-defined QC criteria.
- Provide prompt notification to the Section Manager and/or Technical Directors of problems or anomalies detected.
- Monitor, calibrate, and maintain standard laboratory equipment such as refrigerators, ovens, water systems, thermometers, and micropipettes as necessary.

4.1.2.9. The Data Deliverable Staff is responsible for compiling and archiving data results and analytical reports. Responsibilities include:

- Compiles analytical reports and provides data package and electronic data deliverables (EDD) according to client request.
- Ensures that all aspects of data deliverable production, organization, data archival, packaging and data delivery operations are performed according to client and NELAC requirements.

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4.1.2.10 Sample Control/Receiving personnel are responsible for the receipt and handling of samples within the laboratory. Responsibilities include:

- Implementation of proper sample acceptance policies, sample receipt procedures, sample preservation and bottle order shipments.
- Implements, completes and/or reviews external and internal chain-of-custody, as appropriate.
- Communicates anomalies associated with condition upon receipt of samples to the Project Manager.
- Initiates Non-Conformance Memos for any anomalies or deficiencies identified at sample receipt
- Assigns a laboratory identification number to a sample and logs the sample into the Laboratory Information Management System (LIMS).
- Secures sample storage and preservation.
- Assists the Hazardous Waste Specialist with sample disposal.
- Reviews storage monitoring records.

4.1.2.11 Health and Safety Coordinator / Hazardous Waste Specialist is responsible for the safety and well-being of all employees while at the laboratory. Responsibilities include:

- Implementation and compliance with the Corporate Safety Manual and lab specific addendum.
- Monthly training on mandatory safety topics including but not limited to MSDS's, hazardous waste labeling and accumulation, general lab safety procedures.
- New employee training and 30 day follow-up
- Conduct quarterly safety committee meetings
- Hazardous waste accumulation and disposal
- Maintenance of all hazardous waste related documentation such as, manifests, biennial reports and waste profiles.

4.1.2.12 The Information Technology Department is responsible for the design and maintenance of the laboratory's computer hardware and software. Maintenance and updates of the main LIMS system hardware and software are performed by the Corporate IT Department. Responsibilities include:

- Responsible for preparation, maintenance and implementation of the Information Systems SOP's.
- Implementation and validation of new data systems.
- Network Administration.
- Hardware and software maintenance
- E-mail Administration.
- Provide support and training to all computer users.
- Create reference data and changes to LIMS.
- Review and implementation of all Client specific EDD's.

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Figure 1. STL Los Angeles, CA Organizational Chart

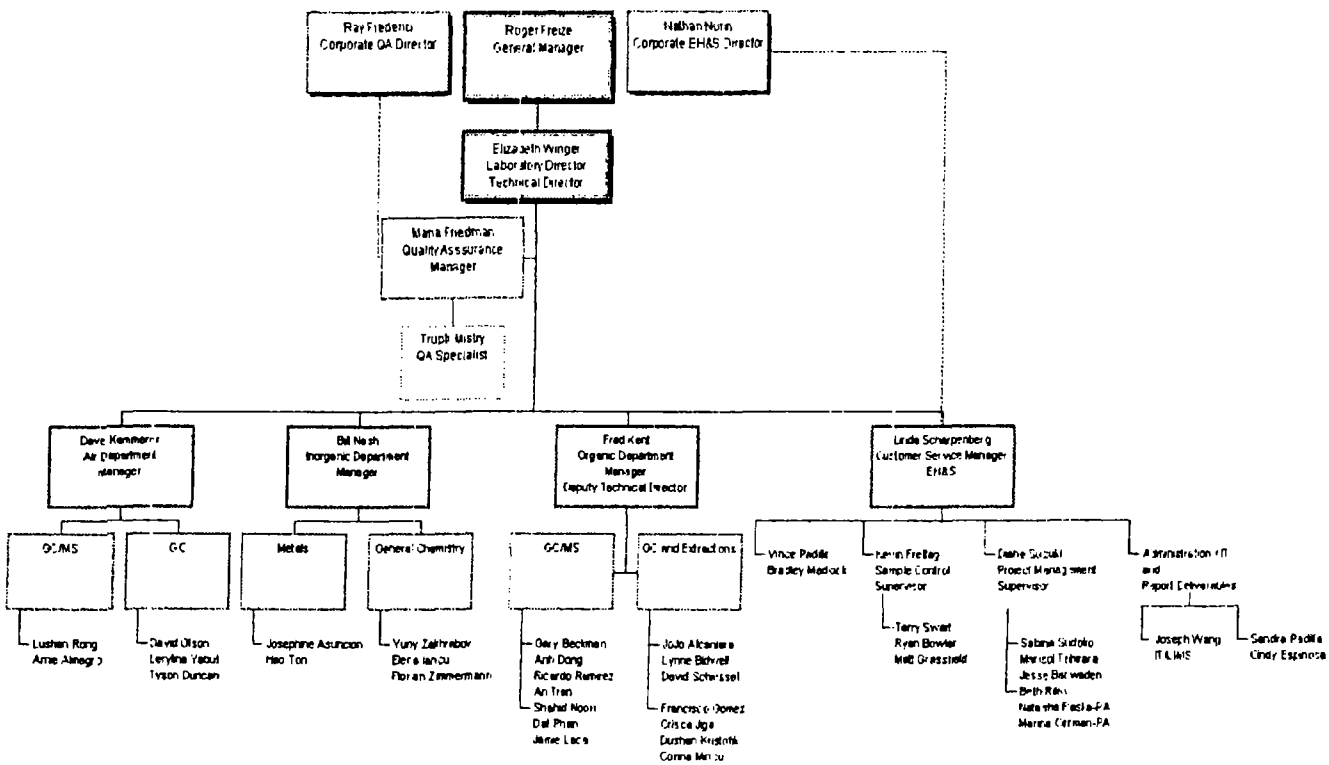

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Table 4. Key Personnel List

Associate Name	Title	Degree	Years of Related Experience
Elizabeth Winger	Laboratory Director Technical Director	BS, Biological Sciences	13
Maria Friedman	Quality Assurance Manager	MBA BS, Chemical Engineering	15
Linda Scharpenberg	Customer Service Manager EH&S Coordinator	MBA BS, Environmental Science	14
Fred Kent	Organic Department Manager Deputy Technical Director	AA, Chemistry	19
David Kammerer	Air Department Manager	BS, Chemistry	14
Bill Nash	Inorganic Department Manager	MA, Biology BS, Marine Biology	23
Joseph Wang	LIMS Administrator	MS, Chemical Engineering	11

4.2. Quality System

4.2.1. Objectives of STL Quality System

The goal of the STL Quality System is to ensure that business operations are conducted with the highest standards of professionalism in the industry. To achieve this goal, it is necessary to provide STL clients with not only scientifically sound, well documented, and regulatory compliant data, but also to ensure that STL provides the highest quality service available in the industry. A well-structured and well-communicated Quality System is essential in meeting this goal. STL's Quality System is designed to minimize systematic error, encourage constructive, documented problem solving, and provide a framework for continuous improvement within the organization. The Corporate QMP is the basis and general outline for STL's Quality System and the Laboratory Quality Manual.

4.2.2. Laboratory Quality Manual (LQM)

The following elements are addressed in the STL facility-specific LQM:

1. Table of Contents, lists of tables, figures and appendices.
2. Quality policy statement, including objectives and commitments, by facility management.
3. Organization and management structure of the laboratory, its place in the STL organization and relevant organizational charts.
4. Relationship between management, operations, support services and the quality system.
5. Record retention procedure.

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6. Document control procedure.
7. Job descriptions of essential staff and reference to job descriptions of other staff.
8. Identification of the laboratory's approval signatories.
9. Procedure for achieving traceability of measurements.
10. List of test methods under which the laboratory performs its testing.
11. Procedure for reviewing new work.
12. Reference to the calibration and/or verification test procedures used.
13. Sample handling procedure.
14. Reference to the major equipment, reference standards, facilities and services used by the laboratory in conducting tests.
15. Reference to procedures for calibration, verification and maintenance of equipment.
16. Reference to verification practices including inter-laboratory comparisons, proficiency testing programs, use of reference materials and internal QC practices.
17. Procedures for feedback and corrective action when testing discrepancies are detected, or departures from policies and procedures occur.
18. Procedure for exceptionally permitting departures from documented policies and procedures or from standard specifications.
19. Procedure for dealing with client complaints.
20. Procedure for protecting client confidentiality and proprietary rights.
21. Procedure for audits and data review.
22. Procedure for establishing that personnel are adequately experienced and trained.
23. Reference to procedures for reporting analytical results.

4.3. Document Control

4.3.1. Document Type

The following documents, at a minimum, are controlled at STL:

- Laboratory Quality Manual
- Standard Operating Procedures (SOP)
- Quality Management Plan
- Environmental Safety and Health SOP's and Manuals

4.3.2. Document Control Procedure

Security and control of documents are necessary to ensure that confidential information is not distributed and that all current copies of a given document are from the latest applicable revision. Unambiguous identification of a controlled document is maintained by identification of the following items in the document header: Document Name, Document Number, Revision Number, Revision Date, Effective Date, Number of Pages. Controlled documents are authorized by, at a minimum, the Laboratory Director and QA Manager. The document preparer, E H& S Coordinator and/or a Technical Specialist may also have their signatures added to SOP's. Controlled documents are marked as such and records of their distribution are kept by QA. A controlled copy number and the following red colored marking identify controlled copies of documents.

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CONTROLLED COPY
Copy No._____
DO NOT DUPLICATE
If this stamp is not colored **red**
This is not a controlled copy.

If the document supersedes a previous revision or replaces a different SOP, this is listed on the title page. SOP's shall not be used to perform work unless they are controlled copies of the approved document, indicated by the attached and completed signature page. Uncontrolled copies of SOP can only be distributed to management for review before the procedure is implemented.

SOP's are numbered to identify the source and application of the document as follows:

Lab Group - Function - ####

Lab Group:

- SANA Soil and Water
- COI Air Toxics

Functions:

MS	Mass Spectrometry
GC	Gas Chromatography
MT	Metals
WC	Wet Chemistry
IP	Inorganic Prep
OP	Organic Prep
QA	Quality Assurance
IT	Information Technology
EHS	Environmental Health and Safety

4.3.3. Document Revision

Changes to documents occur when a procedural change warrants a revision of the document. Minor changes are implemented using SOP Change Forms or Work Instructions. SOP Change Forms undergo the same level of review and approval as the original SOP. Work Instructions can be used to document simple procedures and/or project-specific requirements as placards in labs. These documents are not required to undergo the same level of control as officials SOP's. However, Work Instructions must be approved by the QA Department.

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As approved revisions to controlled documents are prepared and distributed, outdated versions are removed from the laboratory and destroyed. The original copy of each revision is archived by the QA Department for reference purposes. All documents distributed internally are controlled in this manner. Documents distributed externally (to clients, etc.) are controlled on a case by case basis.

4.3.4. Data Recording

All recording of data shall be done directly on preprinted forms or logbooks designed for the record keeping purpose at the time of data generation. Bound logbooks (i.e., permanent, spiral or three-ring) are used for documenting analytical instrument operations (e.g., analysis and maintenance). All pages in permanent and spiral logs must be pre-numbered. Pages inserted into three-ring notebooks must be sequentially numbered as they are added to the notebook. LIMS-generated or electronic forms may be used in place of bound logbooks for documenting sample processing operations (e.g., extraction, digestion, distillation); wet chemical tests; routine monitoring activities for reagent water system, balances, refrigerators, freezers and data review processes.

All blank fields in logbooks or forms must be completed. If an entry is not appropriate for the particular data recording event, that blank space must be marked with a dash or "NA" (not applicable). If extra lines at the end of the data recording event are blank, and will not be used for the next set of data to be recorded, the page must be marked through with a diagonal "\" or "Z" line out to prevent addition of data at a later date. Such a mark must be dated and initialed by the person placing the mark.

Computer printouts, standards certification information, or other printed record may be inserted into the logbooks, if no other data are covered and the information is properly taped into the logbook. To properly tape the article into the logbook, the analyst shall sign over the article being inserted, the tape and the logbook page so that it can be determined if something has been removed.

All manually recorded data entries and corrections in laboratory logbooks and benchsheets must be recorded in permanent ink. Each entry must be legible, dark and clear enough for photocopying. All data corrections to written or printed forms must be made using a single line cross out of the error, and made in such a manner that the original entry may still be read. Each correction must be dated and initialed by the person making the change.

Liquid correction fluid, other correction tape, or other blocking material or obliterating techniques must never be used on any original laboratory data records. (Note: It may be necessary for such an obliteration technique to be used to protect client confidentiality information on copies of laboratory records.)

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4.4. Request, Tender, and Contract Review

4.4.1. Contract Acceptance Review

For many environmental sampling and analysis programs, testing design is site or program specific and does not necessarily "fit" into a standard laboratory service or product. It is STL's intent to provide both standard and customized environmental laboratory services to our clients.
To ensure project success, technical staff performs a thorough review of technical and QA requirements contained in contracts. Contracts, Sampling and Analysis Plans (SAP), Quality Assurance Project Plans (QAPP) and Statements of Work (SOW) are reviewed for defined requirements and STL's capability to meet those requirements before a project is accepted and the analytical work begins.

Any contract requirement or amendment to a contract communicated to STL verbally is documented and confirmed with the client in writing. Any discrepancy between the client's requirements and STL's capability to meet those requirements is resolved in writing by the Laboratory Director before acceptance of the contract. Contract amendments, initiated by the client and/or STL, are documented in writing for the benefit of both the client and STL. All contracts, Quality Assurance Project Plans (QAPP's), Sampling and Analysis Plans (SAP's), contract amendments, and documented communications become part of the permanent project record as defined in Section 4.12.1.

A thorough review of the scope of services is conducted before the laboratory performs additional work within its scope or to expand its scope of testing. The Laboratory Director, with input from the Laboratory Department Managers, considers available resources and both current and pending workload prior to accepting new work.

For the laboratory to expand its scope of testing the same considerations must be given, as well as evaluation of the feasibility of and time frame for method development and proficiency demonstration. The availability of and requirements for certification are considered. Laboratory management including the Laboratory Director, QA Department and Department Managers will consider all above factors with the ultimate decision being that of the General Manager and the Laboratory Director.

If the laboratory determines it has the ability and desire to perform the work, a plan for implementation is prepared. This would include but not be limited to: acquiring necessary equipment, reagents and/or standards, training analyst, writing appropriate SOP's, performing initial demonstration of capability and method detection limit studies (MDL).

4.4.2. Project-Specific Quality Planning

Communication of contract-specific technical and QC criteria is an essential activity in ensuring the success of site-specific testing programs. To achieve this goal, STL assigns a Project Manager (PM) to each client. The PM is the first point of contact for the client. It is the PM and Department Manager's responsibility to ensure that project-specific technical and QC requirements are effectively communicated to the laboratory personnel before and during the project.

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STL has established procedures in order to ensure that communication is inclusive and effective. These include project memos, meetings of project teams, LIMS client checklist, QA Summaries, and start-up meetings between the laboratory staff and the client. STL has found it very effective to invite the client into this process. STL strongly encourages our clients to visit the laboratories and hold formal or informal sessions with employees in order to effectively communicate client needs on an ongoing basis, as well as project-specific details for customized testing programs.

4.4.3. Data Quality Objectives

The data quality objectives (DQO's) discussed below ensure that data are gathered and presented in accordance with procedures appropriate for its intended use and that the data are of known and documented quality able to withstand scientific and legal scrutiny. The quality of the measurement data are defined in terms of precision, accuracy, representativeness, completeness, comparability, and traceability.

Accuracy is a statistical measurement of correctness and includes components of random error (variability due to imprecision) and systemic error. It therefore reflects the total error associated with a measurement. A measurement is accurate when the value reported does not differ from the true value or known concentration of the spike or standard. Analytical accuracy is measured by comparing the percent recovery of analytes spiked into a LCS to a control limit. For volatile and semivolatile organic compounds, surrogate compound recoveries are also used to assess accuracy and method performance for each sample analyzed. STL Los Angeles will provide our clients with LCS historical control limits upon client request to represent the statement of measurement uncertainty as specified by the NELAC standard.

Precision measures the reproducibility of measurements. It is strictly defined as the degree of mutual agreement among independent measurements as the result of repeated application of the same process under similar conditions. Total precision is the measurement of the variability associated with the entire sampling analysis process. It is determined by analysis of duplicate or replicate field samples and measures variability introduced by both the laboratory and field operations. Duplicate samples and matrix duplicate spiked samples are analyzed to assess field and analytical precision. The precision measurement is determined using the relative percent difference (RPD) between the duplicate sample results.

Completeness is defined as the percentage of measurements that are judged to be valid measurements. Factors negatively affecting completeness include the following:

- sample leakage or breakage in transit or during handling
- missing specified holding times
- losing sample during laboratory analysis through accident or improper handling
- improper preservation
- incompatible containers
- insufficient sample quantity
- improper documentation such that traceability is compromised
- rejection of sample result due to failure to conform to QC criteria specifications

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A completeness objective of a least 90% of the data specified by the statement of work is the goal established for most projects.

Representativeness is defined as the degree to which a single measurement is indicative of characteristics of a larger sample or area. More specifically, it is the degree to which the data gathered by the project accurately and precisely represents the actual field conditions. The laboratory makes every effort to ensure a representative aliquot is removed from the sample container. Homogenization of the sample is carried out when appropriate.

Comparability of results between current and past sampling events, and between analytical sequences of a method is achieved through Quality Assurance Project Plans (QAPP), controlled SOP's, approved sample preparation and analytical techniques, consistency in reporting units, and experienced, well trained analysts.

Traceability is the extent to which reported analytical results can be substantiated by supporting documentation. Traceability documentation exists in two essential forms: those, which link the quantitation process to authoritative standards, and those, which explicitly describe the history of each sample from collection to analysis and disposal. The traceability goal for the laboratory is one hundred percent (100%).

4.5. Subcontracting

STL does not routinely subcontract analytical services with the exception of dioxin, asbestos, biological analyses, geo-technical testing, tissue sample preparation, mold analyses and radiological analyses. Subcontracting is arranged with the documented consent of the client, in a timely response, which shall not be unreasonably refused. When any part of the testing covered under NELAC is subcontracted, this work will be placed with a laboratory accredited under NELAC for the tests to be performed. STL will retain records demonstrating that written notification of the client was performed. All QC guidelines specific to the client's analytical program are transmitted to the subcontractor and agreed upon before sending the samples to the subcontract facility. Proof of required certifications from the subcontract facility are maintained in STL project records. Where applicable and available, specific QC guidelines, QAPP's, and/or SAP's are transmitted to the subcontract laboratory. Samples are subcontracted under a formal chain-of-custody (COC) procedure.

A subcontracted laboratory shall be used only after approval is obtained from the client and the quality of the laboratory is determined to be acceptable according to the LQM. Subcontract laboratories may receive an on-site audit by a representative of the STL QA staff if it is deemed appropriate by the QA Manager. The audit involves a measure of compliance with the required test method, QC requirements, as well as any special client requirements. For select tests to be subcontracted, only a document review is performed. This includes a review of the QA Manual, PT scores, state certifications, method SOP's, detection limits, and QC acceptance criteria.

Subcontracted laboratories may be removed from approved status based on a failure to perform adequately, as a result of audit findings, performance in PT studies, and adverse changes in federal and state accreditations. Subcontractors required by clients may not need to go through the same evaluation process.

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Project reports from external subcontract laboratories are not altered and are included in original form in the final project report provided by STL. The subcontract laboratory in the final report to client is clearly identified. Subcontracting may also occur between STL facilities. Subcontracting within STL is subject to the same requirements.

4.6. Purchasing Services and Supplies

Evaluation and selection of suppliers and vendors is done, in part, on the basis of the quality of their products, their ability to meet the demand for their products on a continuous and short term basis, the overall quality of their services, their past history, and competitive pricing. This is achieved through evaluation of objective evidence of quality furnished by the supplier, which can include certificates of analysis, recommendations, and proof of historical compliance with similar programs for other clients. To ensure that quality critical consumables and equipment conform to specified requirements, all purchases are approved by a member of the managerial staff. Controlling the quality of supplies and services is necessary to ensure that STL provides high quality analytical services to our clients.

The STL procurement program requires:

- Assurance that purchased items and services meet requirements set by STL and perform as expected,
- definition of the levels of documentation required for applicable technical and administrative procurement functions, and
- maintenance of records of all suppliers from whom we obtain services or supplies required for our analytical testing.

4.6.1. Selection of Vendors

Materials and supplies are purchased from approved vendors. Vendors are selected based upon criteria appropriate to the material or supplies provided. STL Corporate Policy, PG-001, *Procurement and Contracts*, details the process used. For national vendors and contracts, the vendor is selected by the STL Procurement Director through a competitive bidding process, strategic business alliance or negotiated vendor partnership. Potential vendors are required to complete a vendor acceptance application and are evaluated on the following criteria, as appropriate:

4.6.2. Controlling Quality of Purchased Items

The equipment, reagents, solvents, chemical standards, gases and laboratory containers used in analyses must be of known quality so that their effect upon analytical results can be defined. These quality specifications are derived from analytical method requirements, project-specific requirements and defined national standards for analytical testing. Quality specifications of materials are described in SOP's. Purchasing guidelines for all equipment and reagents effecting data quality are well defined and documented. Similarly, performance specifications are documented for all items of equipment having an effect on data quality.

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Any item critical to the analysis, such as an instrument, reagent, standard purity or glassware received and accepted by the lab is documented. Reagents are dated upon receipt and upon opening to establish their order of use and to minimize the possibility of exceeding their shelf life. The SOP, SANA-QA-0007, *Standard Preparation, Traceability and Preparation*, describes the laboratory's procedures and policies for receipt, tracking, and labeling of reference materials at the laboratory.

The Laboratory Director is responsible for approving purchase orders. The department managers or their designees are responsible for ensuring that the requested quality of materials ordered matches those received, for verifying that material storage is properly maintained and for removing materials from use when the shelf life has expired.

4.6.2.1. Evaluation of Off-the-Shelf Items

For items that are used regularly where no unique requirements or specifications exist, the items may be purchased off-the-shelf. These items are ordered from the supplier on the basis of specifications set forth in the supplier's published product description. These include items such as glassware, filter paper, pipettes and chromatography columns. These items are evaluated as a function of the standard analytical process.

4.6.2.2. Evaluation of Instruments

Evaluation of instruments purchased shall be conducted according to an acceptance testing plan. The acceptance testing plan may be defined by the vendor or the method demonstration requirements specified in the laboratory analytical SOP's. Acceptance criteria may include instrument reliability, sensitivity, stability, selectivity, accuracy, precision, and ability to interface with existing computer systems.

4.6.2.3. Evaluation of Critical Solvents and Acids

STL Los Angeles is a part of a group of STL laboratories that conducts additional evaluations for certain solvents and chemical reagents where our criteria for purity are more stringent than the vendor's. These chemicals are listed in Table 5. These chemicals are subject to analysis on a lot by lot basis before they are put into use. They are tested at one of the STL laboratories, and the chemical test results are evaluated by a designated quality representative.

If the solvents or reagents meet the specifications given in Corporate SOP, S-T-001, *Testing of Solvents and Acids*, an approved memorandum is issued to all participating STL laboratories. Only approved lots may be used by the laboratories. The laboratories will reject any lots not designated as acceptable for use should they be received by a participating STL facility.

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4.6.2.4. Evaluation of Chemical Standards and Reference Materials

Where available, chemical standards will be traceable to the National Institute of Standards Technology (NIST) or an equivalent source. This is largely limited to physical and inorganic chemical standards. If NIST traceability is not commercially available, commercially certified materials shall be used. These materials must be verified for accuracy by the lab before use. Details of the verification procedure are described in the SOP, SANA-QA-0007. Standards must be received with a certification report from the vendor and should include the following information – purity, concentration, traceability, lot number, expiration date, preparation date, unique identification number, formula weight, density, mass and/or volume of standards and suggested storage parameters.

4.6.2.5. Corrective Action for Failure to Meet Required Specifications

Corrective actions for failure of an item to meet required specifications are as follows:

- Review of current supplies to eliminate the problem item
- Notify the STL Procurement Director to avoid additional problems at other STL facilities.
- Return of the problem item to the vendor.
- Evaluation of the impact on product or process.

The QA Manager shall be notified of any significant or systematic quality problems. The STL Procurement Director and STL Quality Assurance Director shall be notified of any quality problems with national vendors.

Table 5. List of Quality-Related Items Needing Evaluation Before Use

Quality-Related Item
Acetone
Dichloromethane
Hexane
Methanol
Toluene
Hydrochloric Acid
Nitric Acid
Sulfuric Acid
Hydrogen Peroxide

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4.7. Service to the Client

Sample representativeness and integrity are the foundations upon which meaningful analytical results rely. A documented and approved sampling plan reflecting data quality objectives should be in place at the sampling site. The integrity of the sample should be maintained through the use of preservation techniques specified in the relevant protocols. Samples should be submitted to the laboratory under standard COC procedures.

4.7.1. Sample Acceptance Policy

Samples are considered "compromised" if the following conditions are observed upon receipt:

- Cooler and/or samples are received outside of temperature specification
- Samples are received broken or leaking
- Samples are received beyond holding time
- Samples are received without appropriate preservative
- Samples are received with inadequate sample volume
- Samples are received in inappropriate containers
- COC does not match samples received
- COC is not properly completed or not received
- Breakage of any Custody Seal or apparent tampering with cooler and/or samples
- Headspace in volatiles samples
- Seepage of extraneous water or materials into samples
- Illegible, impermanent, or non-unique sample labeling

When "compromised" samples are received, it is documented in the Nonconformance database system and the client is contacted for instructions. If the client decides to proceed with analysis, the project report narrative will clearly indicate any of the above conditions and the resolution. Situations that have a direct impact on data quality (ie, headspace in volatile samples, etc.) must be detailed in the case narrative section of the final report. Clients must be notified of the potential for data impact.

4.7.2. Client Confidentiality and Proprietary Rights

Data and sample materials provided by the client or at the client's request, and the results obtained by STL, shall be held in confidence (unless such information is generally available to the public or is in the public domain or client has failed to pay STL for all services rendered or is otherwise in breach of the terms and conditions set forth in the STL and client contract) subject to any disclosure required by law or legal process. STL's reports, and the data and information provided therein, are for the exclusive use and benefit of the client, and are not released to a third party without written consent from the client.

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The audit reports supplied by federal, state, and local regulatory agencies are considered public information and can be released without the written consent of those agencies. However, special project audits are confidential and must be approved by the client before releasing them to a third party. Internal evaluation reports shall be maintained as confidential documents and shall not be released for use outside the laboratory. External auditors may view internal audit reports as part of their on-site audit. Refer to 5.1.4. Ethics, for further information on Confidentiality.

4.8. Client Complaints

STL believes that an effective client complaint handling process has important business and strategic value. Listening to and documenting our client's concerns allows STL to capture "client knowledge" and thus continually improve internal processes to outperform the competition. Implementation of a fair and responsive client complaint system provides assurance to the data user that the lab will stand behind its data, service obligations and products.

Client complaints are documented, communicated to management, and addressed promptly and thoroughly. Client complaints are documented by the employee receiving the complaint, generally a Project Manager, but could be another lab representative. The documentation can take the form of an electronic NCM (Section 4.10) or in a format specifically designed for that purpose. The laboratory policy, QA-SANA-001, *Customer Complaint Policy,* provides detailed procedures to laboratory associates. The Laboratory Director, PM, Customer Services Manager, and QA Manager are informed of all client complaints, and assist in resolving the complaint.

The nature of the complaint is identified, documented, and investigated, and an appropriate action is determined and taken. In cases where a client complaint indicates that an established policy or procedure was not followed, the QA department is required to conduct a special review to assist in resolving the issue. A written confirmation, or letter to the client, outlining the issue and response taken is strongly recommended as part of the overall action taken.

The number and nature of client complaints is reported to the Corporate QA Manager in the QA Monthly report submitted by each facility. The overall number of complaints received is tracked and the appropriateness of the response to client complaints is assessed. Monitoring and addressing the overall level and nature of client complaints and the effectiveness of the solutions is part of the Management Systems Review.

4.9. Control of Nonconformances

A Nonconformance is any out of control occurrence. Nonconformances may relate to client requirements, procedural requirements, or equipment issues. All nonconformances in the laboratory are documented at the time of their occurrence using the NCM database. All nonconformances that affect a sample and/or sample data become part of the affected project's permanent record. When appropriate, reanalysis is performed where QC data falls outside of specifications, or where data appears anomalous. If the reanalysis comes back within established tolerances, the results are approved. If the reanalysis is still outside tolerances, further reanalysis or consultation with the Client, Supervisor, Manager, PM, Laboratory Director, or QA Manager for direction may be required. All records of reanalysis are kept with the project files.

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Where nonconformances specifically affect a client's sample and/or data, the client is informed and action must be taken. Action can take the form of reporting and flagging the data, and including the nonconformance in the project report narrative or cover letter.

4.10. Corrective Action

4.10.1. General

A nonconformance is typically defined as an unplanned deviation from an established protocol. An occurrence of a nonconformance may be the result of STL's actions, which would be rendered as a deficiency, or the result of events beyond STL's control, which would be termed an anomaly. All nonconformances are documented.

Deviations from the LQM or SOP's, deficiencies, errors, or out-of-control situations require corrective action. Documentation of the problem, identification of the cause and follow-up action to prevent recurrence is accomplished using a Nonconformance & Corrective Action Memo (NCM). NCM's are maintained in the comprehensive database, *Clouseau*. A copy of the NCM generated from the database is presented in Figure 2.

Figure 2. Example Nonconformance & Corrective Action Memo

Clouseau
Nonconformance Memo

NCM #:	E00839	Classification:	Anomaly
NCM Initiated By:	Gary Beckman	Status:	[illegible]
Date Opened:	08/18/00	Production Area:	GC/MS
Date Closed:	08/18/00	Tests:	8260B
		Lot #'s (Sample #'s):	E0H180253 (6,7)
		QC Batch:	None.
Nonconformance:	Sample related issues		
Subcategory:	Insufficient sample quantity to perform reanalysis		

[redacted]

Name	Date	Description
[redacted]	[redacted]	[redacted]

[redacted]

Name	Date	Corrective Action
[redacted]	08/18/00	Low level analysis reported, over range [redacted]

[redacted]

Verified By	Due Date	Status	Notes:
	N/A	Verification not required or requested	This sample condition is outside of lab's control. Document in report narrative.

[redacted]

Name	Date Approved:	Position
Gary Beckman	08/18/00	
Fred Kent	08/18/00	
Paul Christi	08/18/00	
Sevda Aleckson	08/18/00	

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