DEPARTMENT OF THE AIR FORCE
AIR FORCE RESEARCH LABORATORY (AFMC)

29 May 98

MEMORANDUM FOR NEW YORK STATE DEPARTMENT OF
ENVIRONMENTAL CONSERVATION
ATTN: MR. DAVID K. HARRINGTON
50 WOLF ROAD
ALBANY NY 12233-7010

FROM: AIR FORCE RESEARCH LABORATORY/IFOCV
153 Brooks Road
Rome NY 13441-4105

SUBJECT: Verona Research Facility- Preliminary Site Assessment, Third Round of Sampling

1. Attached hereto find analytical results from the third round of groundwater sampling performed at the request of your office as a part of the Preliminary Site Assessment at the Verona Research Facility. Additionally, included are the analytical results from the soil sampling for polychlorinated biphenyls you also requested we perform.

2. Based upon our review of the data, we are initiating actions to perform a fourth round of groundwater sampling in the same monitoring wells, for the same sampling protocols and to excavate and dispose of PCB impacted soils to meet TAGM guidance. Should you feel, upon review of the attached, that our proposed actions are inappropriate or insufficient, please contact me at 315-330-4284.

BRUCE H. MERO, REM
Chief, Environmental, Safety
and Occupational Health Office

Attachment:
Analytical Data

cc:
Darrell Sweredoski NYSDEC Region 6
Henriette Hamil NYSDOH Syracuse

Stearns & Wheler, LLC
ENVIRONMENTAL ENGINEERS & SCIENTISTS

May 27, 1998

Mr. Bruce H. Mero, REM
Chief, Environmental Management Branch
Civil Engineering Division
Department of the Air Force
Rome Laboratory
153 Brooks Road
Rome, NY 13441-4105

Re: Verona Soil and Groundwater Results
S&W No. 43189.0

Dear Mr. Mero:

I have received and reviewed the soil and groundwater analytical results from the third round of sampling for the Verona Preliminary Site Assessment (PSA). Please note that the following is a preliminary review of the raw data. The data has been sent for third party data validation and has not yet been returned. There is, however, little chance that the data will be rejected or modified during the validation process.

RESULTS

PCB Sampling

Two samples were collected from each of eight sampling locations (designated A-H). The first sample is a composite sample from 0 to 2 inches; the second is a composite from 0 to 2 feet. The sampling results are summarized in Table 1. The analytical results for location H have not been received from the lab and are therefore not shown on the table. The sampling locations are shown on the attached site plan.

The results of the PCB sampling indicate that the soil adjacent to Building 1233 is impacted with PCBs (specifically Aroclor 1260) at levels exceeding the TAGM HR-64-4046 Recommended Soil Cleanup Objectives. As indicated in Table 1, the majority of the impacted soil is located northwest of Building 1233. Based on preliminary calculations, it will be necessary to excavate and dispose of approximately 60 to 100 cubic yards of soil to meet the TAGM cleanup objectives.

The ultimate limits of the removal can be determined during excavation of the soil using immunoassays which will identify whether there is any PCB impact outside of the original area and, if any, will provide a range in the PCB concentration in this area. When the excavation work is

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concluded, rapid turn around lab samples can be collected and used to verify that cleanup objectives have been met.

Groundwater Sampling

Table 2 illustrates the groundwater analytical results for the three rounds of sampling that have been completed for the PSA. In general, the results indicate that the concentrations in groundwater are affected by the level of the water table. When the water table is elevated the concentrations of the compounds decrease due to dilution and vice versa.

The concentrations of the majority of the compounds increased during the October 1997 sampling round, causing some concern. This increase in the concentration of the VOCs was concurrent with a lowering of the water table (see depth to water measurements in Table 2) due to drier than normal weather conditions. This response to the lowering of the water table is reflected in the concentrations of a number of the compounds. The following compounds were affected: cis 1,2-dichloroethene, (at three of the four wells - the fourth well indicated little change in concentration); trichloroethene at two of the three wells where it was detected (the concentrations in the third well never exceeded standards); chlorobenzene, in the well in which it was detected in all three sampling rounds (MW-001 Building 1231); and 1,1-dichloroethane at well MW-002 Building 1253.

The concentration of tetrachloroethene in well MW-1231C has remained consistent in all three sampling rounds (57, 50, and 60 ug/l, respectively).

The April 1998 sampling results at MW-002 Building 1253 show apparent lab contamination (methylene chloride, acetone, 2-butanone, etc.).

Concentrations of 111-TCA appear to be increasing in well MW-002 Building 1253; from no detection in October 1996, to 22 ug/l in October 1997, to 80 ug/l in April 1998.There is also an elevated concentration of 1,1-dichloroethene at this well - the compound was not detected in previous sampling rounds.

Overall, the concentrations of the detected compounds appear to be remaining steady or decreasing in concentration. The persistence of these compounds is related to two factors. Primarily, there is only a slight hydraulic gradient. Groundwater movement and associated contaminant transport in this area is limited. Seepage velocity of groundwater is on the order of 25 feet per year. Brandy Brook acts as a flow boundary, but there has been no analytical data that would suggest that the chlorinated compounds have reached the brook via groundwater discharge.

Secondly, the groundwater exhibits aerobic conditions at the site (Eh and dissolved oxygen data both indicate the presence of oxygen in the groundwater). The availability of oxygen in the groundwater suggests that the microbial population consists of aerobic bacteria. Chlorinated compounds degrade more readily in anaerobic or oxygen poor conditions. These compounds are not the carbon source of choice for the microbial population.

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CONCLUSIONS AND RECOMMENDATIONS

Based on Stearns & Wheler's review of the available data, the following conclusions have been made.

Exceedances of NYSDEC Soil Cleanup Standards of PCBs were detected at five soil sample locations. Because of the exceedances, we suggest the removal of the impacted soil.

A number of exceedances of groundwater standards were detected during lab analysis for VOCs. In general, the compounds detected were consistent during each sampling event. Fluctuations in concentrations appear to be associated with groundwater elevations. The higher the elevations (greater amount of water) the lower the concentration of the compounds (dilution). To better establish this relationship, a fourth round of groundwater sampling is recommended.

If you have any questions regarding the information provided, please do not hesitate to call.

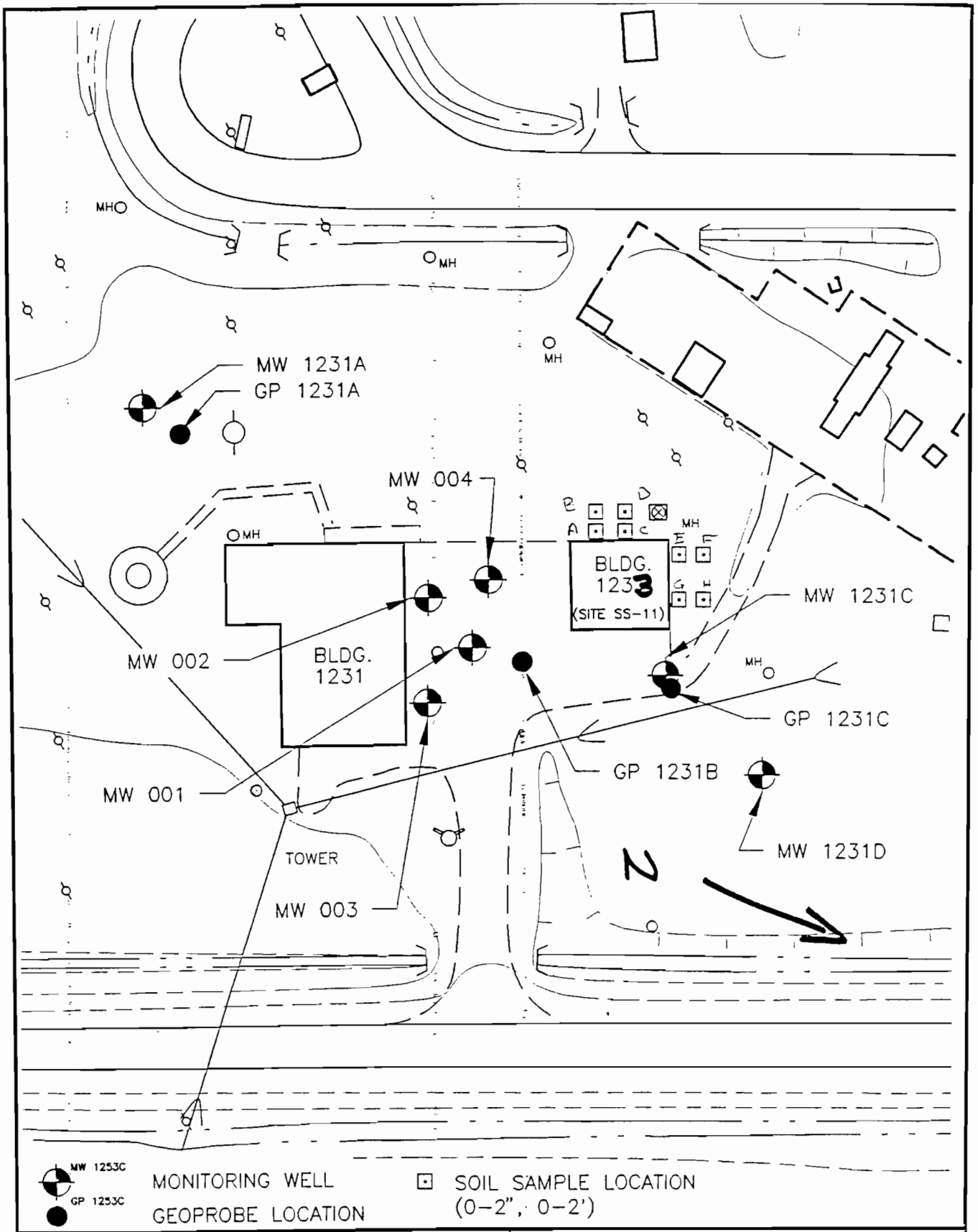
Very truly yours,

Scott L. Graham
Hydrogeologist

SLG/smp

Enclosures

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Stearns & Wheler, LLC
ENVIRONMENTAL ENGINEERS & SCIENTISTS
CAZENOVIA, NEW YORK

DRAWN BY: KMD	VERONA TEST ANNEX BUILDING 1231 MONITORING WELL LOCATIONS
DATE: 2/97	FIGURE 1 BUILDING 1233
JOB NO.: 43189ZA	

Table 1
Soils Analytical Results
PCBs
Verona Research Facility
Verona, NY
Apr-98

	Sample ID & Depth							Soil
Compound (ug/kg)	SS-11A (0-2")	SS-11A (0-2')	SS-11B (0-2")	SS-11B (0-2')	SS-11C (0-2")	SS-11C(0-2')	SS-11D (0-2")	**Std**
Aroclor-1016	U	U	U	U	U	U	U	1000\10000**
Aroclor-1221	U	U	U	U	U	U	U	1000\10000**
Aroclor-1232	U	U	U	U	U	U	U	1000\10000**
Aroclor-1242	U	U	U	U	U	U	U	1000\10000**
Aroclor-1248	U	U	U	U	U	U	U	1000\10000**
Aroclor-1254	U	U	U	U	U	U	U	1000\10000**
Aroclor-1260	**2300**	380	540	78	290	18J	160	1000\10000**

Standards based on NYSDEC TAGM January 24, 1994, Determination of Soil Cleanup Objectives
**surface/subsurface standard
Shaded areas indicate exceedances of standards
See attachment for other qualifiers

	Sample ID & Depth							Soil
Compound (ug/kg)	SS-11D (0-2')	SS-11E (0-2")	SS-11E (0-2')	SS-11F (0-2")	SS-11F (0-2')	SS-11G (0-2")	SS-11G (0-2')	**Std**
Aroclor-1016	U	U	U	U	U	U	U	1000\10000**
Aroclor-1221	U	U	U	U	U	U	U	1000\10000**
Aroclor-1232	U	U	U	U	U	U	U	1000\10000**
Aroclor-1242	U	U	U	U	U	U	U	1000\10000**
Aroclor-1248	U	U	U	U	U	U	U	1000\10000**
Aroclor-1254	U	U	U	U	U	U	U	1000\10000**
Aroclor-1260	25J	**7200**	160	**72000**	**130000**	**32000**	610	1000\10000**

Standards based on NYSDEC TAGM January 24, 1994, Determination of Soil Cleanup Objectives
**surface/subsurface standard
Shaded areas indicate exceedances of standards
See attachment for other qualifiers

Table 2
Groundwater
Analytical Results
Volatile Organic Compounds
Verona Research Facility
Verona, NY
Apr-98

	Building 1231						GW
Compound (ug/l)	**MW-001/Oct 96**	**MW-001/Oct-97**	**MW-001/Apr-98**	**MW1231C/Oct-96**	**MW1231C/Oct 97**	**MW1231C/Apr-98**	**Std.**
Chloromethane	U	100U	U	UJ	10U	U	50
Bromomethane	U	100U	U	U	10U	U	5
Vinyl Chloride	U	100U	U	U	10U	U	2
Chloroethane	UJ	100U	U	UJ	10U	U	5
Methylene Chloride	U	100UJ	U	U	10U	U	5
Acetone	44J	100U	U	UJ	10U	U	50G
Carbon Disulfide	U	100U	U	UJ	10U	U	50
Vinyl Acetate	U	100U	U	U	10U	U	NONE
1,1-Dichloroethene	U	100U	U	U	10U	U	5
1,1-Dichloroethane	U	100U	U	U	10U	U	5
cis-1,2-Dichloroethene	**26**	**38J**	2J	2J	**14**	**6J**	5
Trans-1,2-Dichloroethene	U	100U	U	U	10U	U	5
Chloroform	U	100U	U	U	10U	U	7
1,2-Dichloroethane	U	100U	U	U	10U	U	5
2-Butanone	U	100U	U	U	10U	U	5
1,1,1-Trichloroethane	U	100U	U	U	10U	U	5
Carbon Tetrachloride	U	100U	U	U	10U	U	5
Bromodichloromethane	U	100U	U	U	10U	U	50G
1,2-Dichloropropane	U	100U	U	U	10U	U	5
cis-1,3-Dichloropropene	U	100U	U	U	10U	U	5
Trichloroethene	U	100U	U	5J	**14**	**8J**	5
Dibromochloromethane	U	100U	U	U	10U	U	5
1,1,2-Trichloroethane	U	100U	U	U	10U	U	50G
Benzene	U	**8J**	U	U	10U	U	5
trans-1,3-Dichloropropene	5J	100U	U	U	10U	U	0.7
Bromoform	U	100U	U	U	10U	U	5
4-Methyl-2-Pentanone	U	100U	U	U	10U	U	50G
2-Hexanone	UJ	100U	U	UJ	10U	U	50
Tetrachloroethene	U	100UJ	.7J	**57**	**50**	**60****	5
1,1,2,2-Tetrachloroethane	U	100U	U	U	10U	U	5
Toluene	U	100U	U	U	10U	U	5
Chlorobenzene	**290**	**930J**	U	U	10U	**8J****	5
Ethylbenzene	U	100U	U	U	10U	U	5
Styrene	U	100U	U	U	10U	U	5
Xylene (total)	U	100U	U	U	10U	U	5
Dichlorodifluoromethane	U	100U	U	U	10U	U	5
1,4-Dichlorobenzene	U	100U	.7J	U	10U	U	4.7
Depth to groundwater	2.83	6.25	2.48	3.68	9.8	6.01	

* Treated as UOC
G: NYSDEC guidance value.
ND: No Detectable amounts allowed.
All values in this table are based upon NYSDEC standards as of October 1993.
**Indicate increase in concentration

Table 2
Groundwater
Analytical Results
Volatile Organic Compounds
Verona Research Facility
Verona, NY
Apr-98

	Building 1253						GW
Compound (ug/l)	**MW-002/Oct-96**	**MW-002/Oct 97**	**MW-002/Apr-98**	**MW-004/Oct-96**	**MW-004/Oct 97**	**MW-004/Apr-98**	**Std.**
Chloromethane	U	10U	U	UJ	10U	U	50
Bromomethane	U	10U	U	U	10U	U	5
Vinyl Chloride	U	10U	U	U	10U	U	2
Chloroethane	UJ	10U	U	UJ	10U	U	5
Methylene Chloride	1J	10U	.7J	U	10U	U	5
Acetone	UJ	10U	16B	UJ	10U	U	50G
Carbon Disulfide	U	10U	.5J	U	10U	U	50
Vinyl Acetate	U	10U	U	U	10U	U	NONE
1,1-Dichloroethene	U	10U	**30****	U	10U	U	5
1,1-Dichloroethane	**9J**	**18**	2J	U	10U	U	5
cis-1,2-Dichloroethene	3J	3J	1J	**9J**	**26**	**11**	5
Trans-1,2-Dichloroethene	2J	1J	U	1J	**7J**	2J	5
Chloroform	U	10U	U	U	10U	U	7
1,2-Dichloroethane	U	10U	U	U	10U	U	5
2-Butanone	U	10U	**100****	U	10U	U	5
1,1,1-Trichloroethane	U	**22**	**80****	U	10U	U	5
Carbon Tetrachloride	U	10U	U	U	10U	U	5
Bromodichloromethane	U	10U	U	U	10U	U	50G
1,2-Dichloropropane	U	10U	U	U	10U	U	5
cis-1,3-Dichloropropene	U	10U	U	U	10U	U	5
Trichloroethene	2J	2J	2J	7J	**12**	**6J**	5
Dibromochloromethane	U	10U	U	U	10U	U	5
1,1,2-Trichloroethane	U	10U	U	U	10U	U	50G
Benzene	U	10U	U	U	10U	U	5
trans-1,3-Dichloropropene	U	10U	U	U	10U	U	0.7
Bromoform	U	10U	U	U	10U	U	5
4-Methyl-2-Pentanone	U	10U	U	U	10U	U	50G
2-Hexanone	UJ	10U	U	UJ	10U	U	50
Tetrachloroethene	U	10U	U	U	10U	U	5
1,1,2,2-Tetrachloroethane	U	10U	U	U	10U	U	5
Toluene	U	10U	U	U	10U	U	5
Chlorobenzene	U	10U	U	U	10U	U	5
Ethylbenzene	U	10U	U	U	10U	U	5
Styrene	U	10U	U	U	10U	U	5
Xylene (total)	U	10U	U	U	10U	U	5
Dichlorodifluoromethane	U	10U	U	U	10U	U	5
1,4-Dichlorobenzene	U	10U	U	U	10U	U	4.7
Depth to groundwater	1.58	5.52	2.43	1.31	5.64	2.64	

* Treated as UOC
G: NYSDEC guidance value.
ND: No Detectable amounts allowed.
All values in this table are based upon NYSDEC standards as of October 1993.
**Indicate increase in concentration