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June 16, 2006

Ms. Gloria M. Sosa
Site Investigation & Compliance Branch
U.S. EPA, Region II
290 Broadway, 20th Floor
New York, NY 10007-1866

Mr. Will Welling
New York State DEC
Remedial Bureau D, 12th Floor
625 Broadway
Albany, NY 12233-7013

Re: **Hyde Park Remedial Program**
Bedrock and Overburden Monitoring Programs
APW/AFW Composite Sampling – One Time Sampling Event

Dear Ms. Sosa and Mr. Welling:

This letter is in regard to the APW/AFW Composite Sampling one time event that occurred in November of 2004 with laboratory results received in January of 2005.

Miller Springs Remediation Management, Inc. (MSRMI) presented a work plan for this sampling to the agencies in September of 2004. The purpose of the sampling was to obtain discrete aqueous phase liquid (APL) samples from the APW and AFW wells and piezometers and have each sample analyzed for the APL Plume Monitoring Parameters as presented in Section 6.0 of the work plan. Additionally a composite sample from all of the contributing wells/piezometers was to be analyzed for the same parameters. A mathematical composite would then be calculated from the discrete sampling results and compared to the actual composite sample results.

The work plan was approved by the agencies in October of 2004 and the sampling was completed in November. Results were received in January of 2005. A copy of the results is attached.

It should be noted that some of the results contained estimated values for the non-detects. On one sample (WG-110204-DJT-003 from AFW-2U-04) the laboratory exceeded the method required holding time (by one day) for the SVOC analysis. Therefore SVOC results from this sample were noted as estimated. Values for pesticides on two samples (WG-110204-DJT-003 from AFW-2U-04 and WG-110204- DJT-009 from the composite) were also qualified as estimated due to low (below method requirements) surrogate recoveries.

APL Plume Flux Parameters

According to the Work Plan "The flux to the Niagara River will be calculated using the following equation:

$$\textbf{Flux (g/year)} = \textbf{Q} \times \textbf{3.785 L/Gal.} \times \textbf{Conc. pg/L} \times \mathbf{10^{-12}}\ \textbf{g/pg} \times \textbf{365 days/year}$$

Where:

Q = groundwater flow in gallons per day; and
Conc. = reported concentration of exceedant parameter in pg/L.

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> As was done historically, all non-detect values for parameters will be entered as zeros in this equation. In the event that the method detection limit is greater than the screening level for the parameter, the screening value for the parameter will be used in this equation.
>
> The groundwater flow (Q) is based on the cross-sectional area of the bedrock flow of the wells along the face of the gorge (AFWs and APWs). The calculation of the flow used historically has been 60 gallons per day as presented in the Third Quarter 1997 Bedrock Monitoring Report, Sections 3.4 and 3.5. "

Chloroform and PCB's were not detected at levels far below the Target Detection and Screening Levels. Therefore the concentration values for these parameters (and therefore the flux to the Niagara River) are zero. According to the RRT the Flux Action Level for Chloroform is 1.7 lbs./day and the Flux Action Level for PCB's (as Aroclor 1248) is 0.005 lbs./day.

Mirex also was not detected in the laboratory results. However the non-detection value reported was well above both the Target Detection Level and the Screening Level. A check of the laboratory data did not reveal the reason why the non-detect values were above the limits. The laboratory (Ecology and Environment) has since ceased operations so no explanation for the discrepancy is available. Therefore the flux for this parameter has been conservatively calculated based on the largest non-detect value of 15.4 ug/L. Based upon this value and the work plan information noted above, the flux is calculated per the following equation:

Flux (lb./day) = Q Gal./day X 3.785 L/Gal. X Conc. ug/L X 10^{-9} g/ug X .0022 lb./g
Flux (lb./day) = 60 Gal./day X 3.785 L/Gal. X 15.4 ug/L X 10^{-9} (g/ug) X .0022 lb./g
Flux (lb./day) = 7.69 X 10^{-9} lb./day

This is significantly less than the RRT Flux Action Level of 0.005 lb./day.
The composite non-detect value for Mirex was 9.52 ug/L which would yield a flux of 4.76 X 10^{-9} lb./day. This value is also significantly less than the flux action level contained in the RRT.

The analytical results yielded two estimated values for Dioxin Furans. Both were below the Target Detection Level, so a value of zero could reasonably be entered in the flux equation which would yield a flux value of zero. However a conservative approach was used. utilizing the larger value and calculating the flux. Therefore a concentration of 7.4 pg/L was used in the following equation:

Flux (g/year) = Q Gal./day X 3.785 L/Gal. X Conc. pg/L X 10^{-12} g/pg X 365 days/year
Flux (g/year) = 60 Gal./day X 3.785 L/Gal. X 7.4 pg/L X 10^{-12} (g/pg) X 365 days/year
Flux (g/year) =6.13 X 10^{-7} g/year

This value is much less than the RRT action level of 0.5 g/year.

In conclusion all plume flux values are well below the allowable limits imposed in the RRT.

APL Plume Monitoring Parameters

Discrete and composite samples were taken to compare the results of the composite sample with a mathematical composite calculated from the results of the discrete sampling. The mathematical composite would be based upon factors for the results from each well based upon the following table from the Work Plan:

PROPOSED SAMPLE ALIQUOTS

Well I.D.	*Transmissivity (ft^2/day)*	*Representative Width (ft)*	*Hydraulic Gradient **	*Calculated Flow (GPD)*	*Percent of Flow*	*Required Volume (L)*
APW-1	20	640	0.02	1,914.9	0.9	0.080
APW-2	12	830	0.02	1,490.0	0.7	0.062
AFW-1-06	2	1470	0.02	439.8	0.2	0.018
AFW-1-07	<<1	1470	0.02	0.0	0.0	-
AFW-1-09	<<1	1470	0.02	0.0	0.0	-
AFW-1-11	3	1470	0.02	659.7	0.3	0.027
AFW-2-04	63	1550	0.02	14,608.4	6.8	0.609
AFW-2-05	11	1550	0.02	2,550.7	1.2	0.106
AFW-2-06	<<1	1550	0.02	0.0	0.0	-
AFW-2-07	<<1	1550	0.02	0.0	0.0	-
AFW-2-09	<<1	1550	0.02	0.0	0.0	-
AFW-2-11	<<1	1550	0.02	0.0	0.0	-
AFW-3U	760	1460	0.02	165,996.2	76.8	6.915
AFW-3M	130	1460	0.02	28,394.1	13.1	1.183
AFW-3L	<<1	1460	0.02	0.0	0.0	-
			Totals	**216,053.8**	**100.0**	**9.000**

* If a uniform gradient is assigned, the actual value of the gradient does not affect the calculated flow percentages.

\- No sample collected from these intervals.

Phenol results for both the discrete samples and composite were non-detect at values below the Target Detection Level. Therefore, all values entered into the equation to determine the mathematical composite were zero and the value for the actual composite was zero. No useful comparison can be made.

Benzene results for both the discrete samples and composite were non-detect at values below the Target Detection Level. Therefore, all values entered into the equation to determine the mathematical composite were zero and the value for the actual composite was zero. No useful comparison can be made.

The values for Hexachlorocyclohexanes (BHC's) were non-detect but at well above the Target Detection Limit and Screening Level. A check of the laboratory data did not reveal the reason why the non-detect values were above the limits. The laboratory (Ecology and Environment) has since ceased operations so no explanation for the discrepancy is available. However, since the values are non-detect, there is no way to evaluate the numbers to determine if the mathematical composite would match the actual composite results.

The values for 2-Chlorophenol, 2,4-Dichlorophenol, and 2,4,5-Trichlorophenol were also non-detect at values less than the Target Detection Level for both the discrete samples and the composite. Therefore all values entered into the equation to determine the mathematical composite were zero and the value for the actual composite was zero. No useful comparison can be made.

If you have any questions, please feel free to contact me at 859-543-2174 or by email at don_mcleod@oxy.com.

Sincerely,

Donald W. McLeod, P.E.
Project Manager

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