



## APPENDIX E: Data Verification



*Delivering Environmental, Industrial, and Emergency Solutions*

Bay West Inc.  
5 Empire Drive, St. Paul, MN 55103  
651-291-0456 \* FAX 651-291-0099  
www.baywest.com \* info@baywest.com

November 4, 2004

Ms. Susan Johnson  
Minnesota Pollution Control Agency  
520 Lafayette Road  
St. Paul, Minnesota 55155-4194

**Re: Chemical Data Verification for the Minnesota Slip Project (J040373) – March 2004  
Sampling**

Project data for the above referenced project have been reviewed against standard environmental QC parameters and the criteria listed in the MPCA “Laboratory Data Checklist”

([www.pca.state.mn.us/programs/pubs/qa-chklist.pdf](http://www.pca.state.mn.us/programs/pubs/qa-chklist.pdf)). Data review items include:

- Sample receipt and holding times
- Calibrations
- Blanks
- Laboratory Control Samples (LCS\LCSD)
- Matrix Spikes (MS\MSD)
- Sample duplicates
- Surrogate spikes
- Quantitation limits
- Overall assessment of data

**Sample receipt and holding times**

All samples were collected between 03/05/04 and 03/06/04.

All samples were submitted to the NTS laboratory. Samples for Metals (As, Ba, B, Cd, Cr, Pb, Hg, Se, Ag, and Zn), Diesel Range Organics (DRO), and % Solids were analyzed by NTS. Samples for Total Organic Carbon (TOC), Polynuclear Aromatic hydrocarbons (PAHs) and Polychlorinated Biphenyls (PCBs) were subcontracted by NTS to Minnesota Valley Testing Laboratories (MVTL) for analysis. All samples were received intact and on ice. All samples were analyzed within required holding times.

- 18 samples for Metals (EPA Methods 7060A, 6010B, 7471, and 7740)
  - 17 environmental sample
  - 1 field duplicate
- 18 samples for DRO (Wisconsin DRO Method)
  - 17 environmental sample
  - 1 field duplicate
- 18 samples for % Solids (SM 2540G)
  - 17 environmental sample



- 1 field duplicate
- 18 samples for TOC (EPA Method 415.1)
  - 17 environmental sample
  - 1 field duplicate
- 18 samples for PAHs (EPA Method 8270C)
  - 17 environmental sample
  - 1 field duplicate
- 18 samples for PCBs (EPA Method 8082)
  - 17 environmental sample
  - 1 field duplicate

### **Calibrations**

Since raw data were not submitted with the report, initial calibration data could not be reviewed. Daily Calibration Check data for PAHs all met specified criteria. The PCB Continuing Calibration Check for the Decachlorobiphenyl (DCB) surrogate was slightly below specified criteria on one day and the Ending Calibration Check for DCB was slightly below specified criteria on two days. This may indicate a possible low bias for this surrogate.

### **Blanks**

The Method Blank (MB) criteria was no detected analytes at the RL. All MB's met this criteria.

### **Laboratory Control Samples (LCS/LCSD)**

Laboratory Control Samples (Lab Spikes) were analyzed as a measure of the laboratory's accuracy and precision. All LCS/LCSDs were within specified criteria except for the following:

Analysis	Lab ID	Compound	% Rec	Comment
PAH	15 MAR 2004	Benzidine	3	This compound is typically a very low recovery compound and is not a target analyte.
PAH	18 MAR 2004	Benzidine	1	This compound is typically a very low recovery compound and is not a target analyte.
PAH	22 MAR 2004	Benzidine	4	This compound is typically a very low recovery compound and is not a target analyte.

### **Matrix Spikes (MS/MSD)**

Matrix Spikes were analyzed to determine the effect of the sample matrix on recovery of target analytes. All MSs met criteria except for the following:

Analysis	Lab ID	Compound	MS % Rec	MSD % Rec	Comment
PAH	15 MAR 2004	Benzidine	1	0	This compound is typically a very low recovery compound and is not a target analyte.
PAH	18 MAR 2004	Benzidine	0	0	This compound is typically a very low recovery compound and is not a target analyte.
PAH	22 MAR 2004	Benzidine	10	10	This compound is typically a very low recovery compound and is not a target analyte.
PCB	17 MAR 2004	PCB 1016	125	OK	Data was outside of method criteria but within MPCA checklist guidelines. This compound was not found in any samples. High recovery indicates a possible high bias and therefore no data were qualified.
PCB	18 MAR 2004	PCB 1016	40	39	Data were outside of method criteria but within MPCA checklist guidelines. This compound was not found in any samples. Low recovery indicates a possible low bias. No data were qualified.



Analysis	Lab ID	Compound	MS % Rec	MSD % Rec	Comment
PCB	18 MAR 2004	PCB 1254	38	34	Data were outside of method criteria but within MPCA checklist guidelines. This compound was not found in any samples. Low recovery indicates a possible low bias. No data were qualified.
PCB	19 MAR 2004	PCB 1016	OK	50	Data was outside of method criteria but within MPCA checklist guidelines. This compound was not found in any samples. Low recovery indicates a possible low bias. No data were qualified.
PCB	19 MAR 2004	PCB 1254	42	39	Data were outside of method criteria but within MPCA checklist guidelines. This compound was not found in any samples. Low recovery indicates a possible low bias. No data were qualified.
Metals	S04070075G	Arsenic	77	--	Data was outside of MPCA checklist guidelines. Low recovery indicates a possible low bias. No data were qualified.
Metals	S04070075G	Selenium	37	--	Data was significantly outside of MPCA checklist guidelines. Low recovery indicates a likely low bias. No data were qualified.
Metals	S04070075G	Zinc	79	--	Data was outside of MPCA checklist guidelines. Low recovery indicates a possible low bias. No data were qualified.
Metals	S04070094C	Arsenic	63	--	Data was outside of MPCA checklist guidelines. Low recovery indicates a possible low bias. No data were qualified.
Metals	S04070094G	Selenium	69	--	Data was outside of MPCA checklist guidelines. Low recovery indicates a possible low bias. No data were qualified.

**Sample duplicates**

All laboratory sample duplicates met method criteria.

A blind field duplicate sample was analyzed to assess precision. While there were no Measurement Quality Objectives (MQO's) specified for this duplicate analysis, the results indicate a satisfactory degree of precision between pairs of positive results in all analyses except for PAHs where the two samples (S040700958, S04070095D) varied by a consistent factor of two. No data were qualified.

**Surrogate spikes**

All sample surrogate recoveries met MPCA checklist guidelines except for the following PCB surrogate data:

Sample ID	Surrogate	Surrogate % Recovery	Review Qualifier
WC-TH23(4-8)-4473	TCMX	OK	One of the two PCB surrogates failed low indicating a possible low bias. No data were qualified.
	DCBP	27	
WC-TH18(0-4)-4473	TCMX	OK	One of the two PCB surrogates failed low indicating a possible low bias. No data were qualified.
	DCBP	28	
WC-TH3(8'heave)-4473	TCMX	OK	One of the two PCB surrogates failed low indicating a possible low bias. No data were qualified.
	DCBP	26	

**Quantitation limits**

Because no quantitation limits were specified in the QAPP, the SAP or the Scope of Work, the reporting levels cannot be evaluated against any criteria.

**Overall assessment of data**

All of the requested analyses were completed by the laboratory.



All of the DRO analyses met criteria and no results were qualified.

All of the metals analyses met criteria except for one matrix spike which had low recoveries for arsenic, selenium and zinc; and one matrix spike which had low recoveries for arsenic and selenium. No results were qualified.

All TOC data met criteria and no results were qualified.

One non-target PAH compound had extremely low recoveries on three LCSs and three MS/MSD sets. The blind duplicate precision for PAHs was off by approximately a factor of two. No results were qualified.

Seven PCB matrix spikes were below method criteria and one was above method criteria. All PCB matrix spikes met MPCA checklist guidelines. Three PCB continuing calibration checks were low for the surrogate DCB. One of two PCB surrogates was below MPCA guidelines on three samples. No results were qualified.

Overall, while there are indications of low bias on several analyses, the reported results met MPCA checklist guidelines and no results were either qualified.

If you have any questions or comments regarding this report, please call me at (651) 291-3414.

Sincerely,

Edward J. bacig, PG  
Project Manager  
(651) 291-3413  
edb@baywest.com

*BWJ040373  
DOCS #76175*