

DEPARTMENT OF ECOLOGY

January 4, 1996

TO: Loree Randall, SWRO
FROM: Dave Serdar, EILS
SUBJECT: Results of Sampling for Copper in Drainages to Sylvia Lake
(Waterbody No. WA-22-9090)

Water and sediment samples were collected from three small channels tributary to Sylvia Lake on November 14, 1995. Water samples were analyzed for dissolved copper and hardness. Sediment samples were analyzed for total recoverable copper.

The purpose was to conduct a cursory assessment of copper entering Sylvia Lake from the surrounding area. Sylvia Lake has been repeatedly treated with copper compounds to control algae. A 1994 survey of Sylvia Lake showed that copper levels in the lake and upper outlet stream exceeded water quality criteria for at least 18 days following a summertime copper sulfate application (Serdar, 1995).

The present sampling was conducted in the wet season, following substantial rainfall during the preceding week. Three distinct seasonal drainages were observed flowing to the lake on the day of sampling. All three of these drainages were sampled where they were accessible nearest the lake. **Site 1** was located at the eastern end of the lake near the southeast corner. The channel appeared to drain the mostly residential area east of the lake. **Site 2** was located at a channel draining the residential area north-northeast of the lake, although part of this flow was a small stream in a forested break between houses and may be spring-fed. Discharge at both Sites 1 and 2 was estimated to be 1 cubic foot per second (cfs). **Site 3** was located between Wollochet Road and the southern shore of Sylvia Lake, near the southeast corner of the lake. Site 3 appeared to be draining a mostly forested area on the south side of Wollochet Road. Sediment samples were collected in addition to water at this site because it was the only site with mostly fine-grained sediments. Discharge at Site 3 was also estimated to be 1 cfs.

Concentrations of copper in water and sediment samples were uniformly low (Table 1). Only site 1 had detectable dissolved copper, at a concentration slightly above the chronic criterion of 4.5 µg/L. However, no copper was detected in a duplicate water sample collected at the same site. Results of the sediment analysis was somewhat compromised due to the presence of copper in the laboratory blank (1.1 mg/Kg), but the sample results indicate no significant accumulation of copper at Site 3. A copy of the laboratory results and accompanying Quality Assurance Memoranda are included as an appendix.

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In conclusion, results of sampling conducted on November 14, 1995 indicate that none of the drainages sampled constitute a significant source of copper to Sylvia Lake.

REFERENCES

Serdar, D., 1995. Results of Monitoring Copper Sulfate Application to Sylvia Lake. Ecology Report #95-322.

DS:krc
Attachments (Table 1 and Appendix)

cc: Larry Goldstein

Table 1. Concentrations of Copper and Water and Sediment in Seasonal Tributaries to Sylvia Lake (ug/L except for sediment [mg/Kg,dry]).

Site No.	Sample No./Type	Hardness (as mg/L CaCO ₃)	Copper	WQ Criteria* (acute)	WQ Criteria* (chronic)
1	468040/Diss. Water	38.6	4.7	6.2	4.5
	468041/Diss. Water	39.2	U(4)	6.3	4.6
2	468042/Diss. Water	26.7	U(4)	4.4	3.3
3	468043/Diss. Water	35.9	U(4)	5.8	4.2
	468045/Sediment	--	7.7 B	--	--
	468046/Sediment	--	8.7 B	--	--

*Criteria are hardness-dependent

U=Not detected at concentration shown in parentheses

B=Copper was detected in the laboratory blank



STATE OF WASHINGTON

DEPARTMENT OF ECOLOGY

MANCHESTER ENVIRONMENTAL LABORATORY

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December 21, 1995

To: David Serdar
From: Randy Knox, Metals Chemist ^{RS}
Subject: Sylvia Lake Project - Sediment

QUALITY ASSURANCE SUMMARY

Data quality for this project is generally good. However, traces of copper were detected in the associated procedure blank as described below.

SAMPLE INFORMATION

The samples from the Sylvia Lake Project were received by the Manchester Laboratory on 1/15/95 in good condition.

HOLDING TIMES

All analyses were performed within the USEPA Contract Laboratory Program (CLP) holding times for metals analysis (28 days for mercury, 180 days for all other metals).

INSTRUMENT CALIBRATION

Instrument calibration was performed before each analytical run and checked by initial calibration verification standards and blanks. Continuing calibration standards and blanks were analyzed at a frequency of 10% during the run and again at the end of the analytical run. All initial and continuing calibration verification standards were within the relevant USEPA (CLP) control limits. AA calibration gave a correlation coefficient (r) of 0.995 or greater, also meeting CLP calibration requirements.

PROCEDURAL BLANKS

The procedural blank associated with these samples shows traces of copper. Sample levels are less than 10X the level in the procedure blank and are flagged with a B to indicate reported values may be elevated by the blank level.

SPIKED SAMPLES ANALYSIS

Spiked and duplicate spiked sample analysis were performed on this data set. All spike recoveries are within the CLP acceptance limits of +/- 25%.

PRECISION DATA

The results of the spiked and duplicate spiked samples are used to evaluate precision on this sample set. The relative percent difference (RPD) for all analytes is within the 20% CLP acceptance window for duplicate analysis.

LABORATORY CONTROL SAMPLE (LCS) ANALYSIS

LCS analyses are within the windows established for each parameter.

Please call Bill Kammin at SCAN 360-871-8801 to further discuss this project.

RLK.rlk

Manchester Environmental Laboratory

Department of Ecology

Analysis Report for

Hardness

Project Name: Sylvia Lake

LIMS Project ID: 2333-95

Project Officer: D. Serdar
Date Reported: 21-NOV-95

Method: EPA130.2
Matrix: Water
Analyte: Hardness

Sample	QC	Field ID	Result	Qualifier	Units	Received	Analyzed
95468040		SYLVIALK	38.6		mg/L	11/15/95	11/20/95
95468041		SYLVIALK	39.2		mg/L	11/15/95	11/20/95
95468042		SYLVIALK	26.7		mg/L	11/15/95	11/20/95
95468043		SYLVIALK	35.9		mg/L	11/15/95	11/20/95
95468044		SYLVIALK	0.00		mg/L	11/15/95	11/20/95
95468044	Duplicate		0.00		mg/L	11/15/95	11/20/95

Authorized By: *D. Tromso*

Release Date: 11/21/95

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Manchester Environmental Laboratory

Department of Ecology

Analysis Report for

Copper, Dissolved

Project Name: Sylvia Lake

LIMS Project ID: 2333-95

Project Officer: D. Serdar
Date Reported: 20-DEC-95

Method: EPA200.7
Matrix: Water
Analyte: Copper

Sample	QC	Field ID	Result	Qualifier	Units	Received	Analyzed
95468040		SYLVIALK	4.7		ug/L	11/15/95	12/19/95
95468041		SYLVIALK	4	U	ug/L	11/15/95	12/19/95
95468042		SYLVIALK	4	U	ug/L	11/15/95	12/19/95
95468043		SYLVIALK	4	U	ug/L	11/15/95	12/19/95
95468043	Matrix Spike		114 %			11/15/95	12/19/95
95468043	Matrix Spike		112 %			11/15/95	12/19/95
95468044		SYLVIALK	4	U	ug/L	11/15/95	12/19/95
BLN54167		WPB5100	4	U	ug/L		12/19/95
LCS54168		WLC5100	103 %				12/19/95

Authorized By: Randy Skowt

Release Date: 12-21-95

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Manchester Environmental Laboratory

Department of Ecology

Analysis Report for

Copper

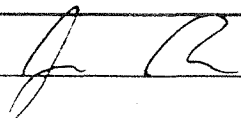
Project Name: Sylvia Lake

LIMS Project ID: 2333-95

Project Officer: D. Serdar
Date Reported: 11-DEC-95

Method: EPA200.7
Matrix: Sediment/Soil
Analyte: Copper

Sample	QC	Field ID	Result	Qualifier	Units	Received	Analyzed
95468045		SYLVIALK	7.7	B	mg/Kg Dry Wt.	11/15/95	11/22/95
95468045	Matrix Spike		95 %			11/15/95	11/22/95
95468045	Matrix Spike		94 %			11/15/95	11/22/95
95468046		SYLVIALK	8.7	B	mg/Kg Dry Wt.	11/15/95	11/22/95
BLN53915		SPB4649	1.1		mg/Kg Dry Wt.		11/22/95
LCS54002		LCS4649	90 %				11/22/95

Authorized By: 

Release Date: 12/11/95

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