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WASHINGTON STATE DEPARTMENT OF ECOLOGY
ENVIRONMENTAL INVESTIGATIONS AND LABORATORY SERVICES
MANCHESTER ENVIRONMENTAL LABORATORY

November 26, 1991

FEB 1992
RECEIVED
EDMC

TO: Joe Witczak

FROM: Bill Kammin, Envirnomental_Lab_Director BK

SUBJECT: 183-H Basins Metals Results

SAMPLE RECEIPT

The samples from the 183-H Basins project were received by the Manchester Laboratory on 10/25/91 in good condition.

HOLDING TIMES

All analyses were performed within the specified 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 control limits of +/- 10%. AA calibration gave correlation coefficients greater than the criteria of 0.995. A correlation coefficient of 0.995 or higher means that the calibration is acceptable.

PROCEDURAL BLANKS

The procedural blanks associated with these samples showed detectable levels of zinc, chromium and copper. Sample results for these elements were flagged with a B, denoting trace blank contamination.

SPIKED SAMPLE ANALYSIS

Spiked sample and duplicate spiked sample analysis were performed on sample numbers 91438044 and 91438046. All spike recoveries were within the acceptance limits of +/- 25%, except for lead and antimony. Appropriate lead and antimony sample results were flagged with N, denoting spike recovery results outside the acceptance limits. These results may indicate non-homogeneity in the sample matrix, or other interferences.

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PRECISION DATA

The duplicate results of the spiked and duplicate spiked sample were used to calculate precision related to the analysis of these samples. The % RPD for all parameters was within the +/- 20% window for duplicate analysis.

ICP SERIAL DILUTION ANALYSIS

Only zinc and sodium results were high enough to be subject to the serial dilution test. Both failed the 10% window, which may indicate unknown interferences in the sample. Zinc and sodium results are qualified with an E, indicating possible interferences.

SUMMARY

The data generated by the analysis of the above referenced samples can be used with the above-mentioned qualification.

Sample results were under the MCTA Method A Cleanup Levels for industrial and non-industrial soils. TCLP analyses were not performed on these samples. Based on the total recoverable metals results, these samples would not designate as hazardous waste under the TCLP regulations.

If you have any questions about the results or the methods used to obtain these results, please call me at SCAN 744-4737.

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Washington State Department of Ecology
Sample/Project Analysis Results

9 2 1 2 5 3 1 4 2 3

Project: DOE-390Z 183-H BASINS

Officer: JJW Account: K3362

Laboratory: Ecology, Manchester

Sample No: 91 438040 Description: JW11

Source: Soil (Spill/Contaminated Area)

Begin Date: 91/10/22 :

All Lab contract Data

Metals - Specified		Sediment Result	Units
Mercury	Hg-Sedmt	0.038P*	mg/kg-wt

Metals - ICP Scan		Sediment Result	Units
Sodium	Na-Sedmt	153E*	mg/kg-dr
Arsenic	As-Sedmt	13P*	mg/kg-dr
Berylium	Be-Sedmt	0.31P*	mg/kg-dr
Cadmium	Cd-Sedmt	0.45P*	mg/kg-dr
Chromium	Cr-Sedmt	9.25 *	mg/kg-dr
Copper	Cu-Sedmt	12.5B*	mg/kg-dr
Lead	Pb-Sedmt	14N*	mg/kg-dr
Nickel	Ni-Sedmt	8.3 *	mg/kg-dr
Zinc	Zn-Sedmt	30.0E*	mg/kg-dr
Antimony	Sb-Sedmt	3.0UN	mg/kg-dr

Contract Lab Program		Sediment Result	Units
NO3-N	Sedmt	REQ	mg/kg-dr
pH Sedmt	Meter	REQ	Std Unts
Sulfate	Sedmt	REQ	mg/kg-dr

(Sample Complete)

9 2 1 2 0 1 4 2 4

Project: DOE-390Z 183-H BASINS

Officer: JJW

Account: K3362

Laboratory: Ecology, Manchester

Sample No: 91 438041

Description: JW12

Source: Soil (Spill/Contaminated Area)

Begin Date: 91/10/22 :

Metals - Specified		Sediment Result	Units
Mercury	Hg-Sedmt	0.0091P*	mg/kg-wt

Metals - ICP Scan		Sediment Result	Units
Sodium	Na-Sedmt	175E*	mg/kg-dr
Arsenic	As-Sedmt	14P*	mg/kg-dr
Berylium	Be-Sedmt	0.36 *	mg/kg-dr
Cadmium	Cd-Sedmt	0.33 *	mg/kg-dr
Chromium	Cr-Sedmt	8.50 *	mg/kg-dr
Copper	Cu-Sedmt	13.5B*	mg/kg-dr
Lead	Pb-Sedmt	7.6PN*	mg/kg-dr
Nickel	Ni-Sedmt	9.4 *	mg/kg-dr
Zinc	Zn-Sedmt	29.3E*	mg/kg-dr
Antimony	Sb-Sedmt	3.0UN	mg/kg-dr

Contract Lab Program		Sediment Result	Units
NO3-N	Sedmt	REQ	mg/kg-dr
pH Sedmt	Meter	REQ	Std Unts
Sulfate	Sedmt	REQ	mg/kg-dr

(Sample Complete)

9 2 1 2 0 1 4 2 5

Project: DOE-390Z 183-H BASINS

Officer: JJW

Account: K3362

Laboratory: Ecology, Manchester

Sample No: 91 438042

Description: JW21

Source: Soil (Spill/Contaminated Area)

Begin Date: 91/10/22 :

Metals - Specified		Sediment Result	Units
Mercury	Hg-Sedmt	0.017P*	mg/kg-wt

Metals - Specified Matrix Spike #1		Sediment Result	Units
Mercury	Hg-Sedmt	112	% Recov

Metals - Specified Matrix Spike #2		Sediment Result	Units
Mercury	Hg-Sedmt	122	% Recov

Metals - ICP Scan		Sediment Result	Units
Sodium	Na-Sedmt	172E*	mg/kg-dr
Arsenic	As-Sedmt	16P*	mg/kg-dr
Berylium	Be-Sedmt	0.35P*	mg/kg-dr
Cadmium	Cd-Sedmt	0.28P*	mg/kg-dr
Chromium	Cr-Sedmt	8.47 *	mg/kg-dr
Copper	Cu-Sedmt	12.2B*	mg/kg-dr
Lead	Pb-Sedmt	4.1PN*	mg/kg-dr
Nickel	Ni-Sedmt	10.1 *	mg/kg-dr
Zinc	Zn-Sedmt	29.1E*	mg/kg-dr
Antimony	Sb-Sedmt	3.0UN	mg/kg-dr

Contract Lab Program		Sediment Result	Units
NO3-N	Sedmt	REQ	mg/kg-dr
pH Sedmt	Meter	REQ	Std Unts
Sulfate	Sedmt	REQ	mg/kg-dr

(Sample Complete)

Washington State Department of Ecology
Sample/Project Analysis Results

9 2 1 2 5 0 1 1 4 2 6

Project: DOE-390Z 183-H BASINS Officer: JJW Account: K3362

Laboratory: Ecology, Manchester

Sample No: 91 438043 Description: JW22 Source: Soil (Spill/Contaminated Area)

Begin Date: 91/10/22 :

Metals - Specified		Sediment Result	Units
Mercury	Hg-Sedmt	0.0091P*	mg/kg-wt

Metals - ICP Scan		Sediment Result	Units
Sodium	Na-Sedmt	150E*	mg/kg-dr
Arsenic	As-Sedmt	14P*	mg/kg-dr
Berylium	Be-Sedmt	0.30P*	mg/kg-dr
Cadmium	Cd-Sedmt	0.36P*	mg/kg-dr
Chromium	Cr-Sedmt	8.19 *	mg/kg-dr
Copper	Cu-Sedmt	11.8B*	mg/kg-dr
Lead	Pb-Sedmt	3.2PN*	mg/kg-dr
Nickel	Ni-Sedmt	9.3P*	mg/kg-dr
Zinc	Zn-Sedmt	27.0E*	mg/kg-dr
Antimony	Sb-Sedmt	3.0UN	mg/kg-dr

Contract Lab Program		Sediment Result	Units
NO3-N	Sedmt	REQ	mg/kg-dr
pH Sedmt	Meter	REQ	Std Unts
Sulfate	Sedmt	REQ	mg/kg-dr

(Sample Complete)

9 2 1 2 5 9 1 1 4 2 7

Project: DOE-3902 183-H BASINS Officer: JJW Account: K3362

Laboratory: Ecology, Manchester

Sample No: 91 438044 Description: JW31 Source: Soil (Spill/Contaminated Area)

Begin Date: 91/10/22 :

Metals - Specified		Sediment Result	Units
Mercury	Hg-Sedmt	0.013P*	mg/kg-wt

Metals - ICP Scan		Sediment Result	Units
Sodium	Na-Sedmt	227E*	mg/kg-dr
Arsenic	As-Sedmt	25 *	mg/kg-dr
Berylium	Be-Sedmt	0.48P*	mg/kg-dr
Cadmium	Cd-Sedmt	0.60P*	mg/kg-dr
Chromium	Cr-Sedmt	11.3 *	mg/kg-dr
Copper	Cu-Sedmt	14.2B*	mg/kg-dr
Lead	Pb-Sedmt	50.3 *	mg/kg-dr
Nickel	Ni-Sedmt	12.6 *	mg/kg-dr
Zinc	Zn-Sedmt	36.6E*	mg/kg-dr
Antimony	Sb-Sedmt	3.0UN	mg/kg-dr

Metals - ICP Scan Matrix Spike #1		Sediment Result	Units
Sodium	Na-Sedmt	NA	% Recov
Arsenic	As-Sedmt	75	% Recov
Berylium	Be-Sedmt	90	% Recov
Cadmium	Cd-Sedmt	95	% Recov
Chromium	Cr-Sedmt	80	% Recov
Copper	Cu-Sedmt	90	% Recov
Lead	Pb-Sedmt	75	% Recov
Nickel	Ni-Sedmt	76	% Recov
Zinc	Zn-Sedmt	78	% Recov
Antimony	Sb-Sedmt	NA	% Recov

Contract Lab Program		Sediment Result	Units
NO3-N	Sedmt	REQ	mg/kg-dr
pH Sedmt	Meter	REQ	Std Unts
Sulfate	Sedmt	REQ	mg/kg-dr

(Sample Complete)

9 2 1 2 0 1 1 4 2 8

Project: DOE-390Z 183-H BASINS Officer: JJW Account: K3362

Laboratory: Ecology, Manchester

Sample No: 91 438045 Description: JW32 Source: Soil (Spill/Contaminated Area)

Begin Date: 91/10/22 :

Metals - Specified		Sediment Result	Units
Mercury	Hg-Sedmt	0.012P*	mg/kg-wt

Metals - ICP Scan		Sediment Result	Units
Sodium	Na-Sedmt	155E*	mg/kg-dr
Arsenic	As-Sedmt	15P*	mg/kg-dr
Berylium	Be-Sedmt	0.32P*	mg/kg-dr
Cadmium	Cd-Sedmt	0.37P*	mg/kg-dr
Chromium	Cr-Sedmt	8.03 *	mg/kg-dr
Copper	Cu-Sedmt	12.5B*	mg/kg-dr
Lead	Pb-Sedmt	13N*	mg/kg-dr
Nickel	Ni-Sedmt	9.4 *	mg/kg-dr
Zinc	Zn-Sedmt	27.3E*	mg/kg-dr
Antimony	Sb-Sedmt	3.0UN	mg/kg-dr

Contract Lab Program		Sediment Result	Units
NO3-N	Sedmt	REQ	mg/kg-dr
pH Sedmt	Meter	REQ	Std Unts
Sulfate	Sedmt	REQ	mg/kg-dr

(Sample Complete)

9 1 2 0 1 4 2 9

Project: DOE-390Z 183-H BASINS Officer: JJW Account: K3362

Laboratory: Ecology, Manchester

Sample No: 91 438046 Description: JW40 Source: Soil (Spill/Contaminated Area)

Begin Date: 91/10/22 :

Metals - Specified		Sediment Result	Units
Mercury	Hg-Sedmt	0.025P*	mg/kg-wt

Metals - ICP Scan		Sediment Result	Units
Sodium	Na-Sedmt	142E*	mg/kg-dr
Arsenic	As-Sedmt	15P*	mg/kg-dr
Berylium	Be-Sedmt	0.26 *	mg/kg-dr
Cadmium	Cd-Sedmt	0.25 *	mg/kg-dr
Chromium	Cr-Sedmt	8.48 *	mg/kg-dr
Copper	Cu-Sedmt	12.3B*	mg/kg-dr
Lead	Pb-Sedmt	5.0PN*	mg/kg-dr
Nickel	Ni-Sedmt	9.6 *	mg/kg-dr
Zinc	Zn-Sedmt	27.8E*	mg/kg-dr
Antimony	Sb-Sedmt	3.0UN	mg/kg-dr

Metals - ICP Scan Matrix Spike #1		Sediment Result	Units
Sodium	Na-Sedmt	NA	% Recov
Arsenic	As-Sedmt	77	% Recov
Berylium	Be-Sedmt	90	% Recov
Cadmium	Cd-Sedmt	94	% Recov
Chromium	Cr-Sedmt	82	% Recov
Copper	Cu-Sedmt	85	% Recov
Lead	Pb-Sedmt	150	% Recov
Nickel	Ni-Sedmt	79	% Recov
Zinc	Zn-Sedmt	80	% Recov
Antimony	Sb-Sedmt	5	% Recov

Metals - ICP Scan Matrix Spike #2		Sediment Result	Units
Sodium	Na-Sedmt	NA	% Recov
Arsenic	As-Sedmt	74	% Recov
Berylium	Be-Sedmt	89	% Recov
Cadmium	Cd-Sedmt	94	% Recov
Chromium	Cr-Sedmt	81	% Recov
Copper	Cu-Sedmt	87	% Recov
Lead	Pb-Sedmt	77	% Recov
Nickel	Ni-Sedmt	76	% Recov
Zinc	Zn-Sedmt	80	% Recov

Metals - ICP Scan *** Continued *** Matrix Spike #2		Sediment Result	Units
Antimony	Sb-Sedmt	6	% Recov

Contract Lab Program		Sediment Result	Units
NO3-N	Sedmt	REQ	mg/kg-dr
pH Sedmt	Meter	REQ	Std Unts
Sulfate	Sedmt	REQ	mg/kg-dr

(Sample Complete)

9 2 1 2 5 9 1 1 4 3 0

Project: DOE-390Z 183-H BASINS

Officer: JJW

Account: K3362

Blank ID: ESPB 45.13

Metals - ICP Scan Blank #1		Sediment Result	Units
Sodium	Na-Sedmt	1.4U	mg/kg-dr
Arsenic	As-Sedmt	3.0U	mg/kg-dr
Berylium	Be-Sedmt	0.10U	mg/kg-dr
Cadmium	Cd-Sedmt	0.20U	mg/kg-dr
Chromium	Cr-Sedmt	0.54P*	mg/kg-dr
Copper	Cu-Sedmt	1.5 *	mg/kg-dr
Lead	Pb-Sedmt	2.0U	mg/kg-dr
Nickel	Ni-Sedmt	1.0U	mg/kg-dr
Zinc	Zn-Sedmt	0.40U	mg/kg-dr
Antimony	Sb-Sedmt	3.0U	mg/kg-dr

(Sample Complete)

9 2 1 2 5 0 1 1 4 3 1

Project: DOE-390Z 183-H BASINS Officer: JJW Account: K3362

Blank ID: ESPB 45.14

Metals - Blank #2	ICP Scan	Sediment Result	Units
Sodium	Na-Sedmt	1.0U	mg/kg-dr
Arsenic	As-Sedmt	3.0U	mg/kg-dr
Berylium	Be-Sedmt	0.10U	mg/kg-dr
Cadmium	Cd-Sedmt	0.20U	mg/kg-dr
Chromium	Cr-Sedmt	0.65P*	mg/kg-dr
Copper	Cu-Sedmt	0.99P*	mg/kg-dr
Lead	Pb-Sedmt	2.0U	mg/kg-dr
Nickel	Ni-Sedmt	1.0U	mg/kg-dr
Zinc	Zn-Sedmt	0.40U	mg/kg-dr
Antimony	Sb-Sedmt	3.0U	mg/kg-dr

(Sample Complete)

9 2 1 2 3 9 1 1 4 3 2

Project: DOE-390Z 183-H BASINS Officer: JJW Account: K3362

Blank ID: ESPB 45.15

Metals - ICP Scan Blank #1		Sediment Result	Units
Sodium	Na-Sedmt	2.7U	mg/kg-dr
Arsenic	As-Sedmt	3.0U	mg/kg-dr
Berylium	Be-Sedmt	0.10U	mg/kg-dr
Cadmium	Cd-Sedmt	0.20U	mg/kg-dr
Chromium	Cr-Sedmt	0.50U	mg/kg-dr
Copper	Cu-Sedmt	1.6 *	mg/kg-dr
Lead	Pb-Sedmt	2.0U	mg/kg-dr
Nickel	Ni-Sedmt	1.0U	mg/kg-dr
Zinc	Zn-Sedmt	0.40U	mg/kg-dr
Antimony	Sb-Sedmt	3.0U	mg/kg-dr

(Sample Complete)