Storm Water Samples From Herculaneum

Sample Location	Sample #	Results in micrograms/liter (ppb) Total Pb	Total Zn	Total Cd	Total As
STORM WATER DRAINAGES					
SE side of town N. of WWTF (SS-7)	211379	4960	503	73.9	7
Main & Dunklin (SS-10)	211381	1280	529	12.2	18.7
Brown St. S. of Curved St. (SS-6)	211378	3910	429	43	12.7
Brown St. uphill from Park (SS-5)	211377	7050	663	60.4	12.6
Brown St. at Bates Memorial Park (SS-4)	211376	6270	671	88	6.8
209 Joachim W. of SS-11	211382	2590	659	16.9	14.5
Reservoir St. S. of Joachim (SS-11)	211383	984	134	5.69	3.7
Ditch SE side of slag pile (W-8/SS-9)	123599	46.6	1160	10.5	1.2
Ravine N of city hall (SS-13)	211380	462	145	11.1	5.7
CREEK SAMPLES					
Joachim Cr. Above I-55 (W-1)	123583	18.1	12.6	nd	nd
Joachim Cr. above bridge at slag pile (W-3)	123585	14.5	7.28	nd	nd
Joachim Cr. W. of slag pile (W-4)	123587	20.7	19.7	nd	1.6
Joachim Cr. E. of slag pile (W-5)	123588	14.5	14.5	nd	1.5
Joachim Cr. E. of slag pile below city drainage (W-6)	123589	18.6	21	nd	1.5
Joachim Cr. E. of slag pile near mouth (W-7)	123590	19.7	21.3	nd	1.8

nd = non detect

Conclusions:
Major Pb loading is coming from city streets and is highest associated with haul roads.
Metal ratios indicate a concentrate or smelter emission source; not slag.
Elevated Zn is found in slag pile drainage.
Concentrations become diluted in Joachim Creek.

Missouri Acute Aquatic Life Criteria*	63-150	265-479	31-68	20
Missouri Chronic Aquatic Life Criteria*	9-23	241-433	9.1-15.5	20

* Missouri ALC are for dissolved metals.
Values vary depending on water hardness.

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Superfund

Sediment/Soil Samples from Herculaneum

Sample Location	Sample #	Results in milligrams/killogram (ppm) Total Pb	Total Zn	Total Cd	Total As
SOIL/SEDIMENT SAMPLES FROM DRAINAGE DITCHES					
Main & Dunklin (SS-10)	144768	2480	1920	9.3	8.3
Behind City Hall near Circle St. (SS-13)	144770	4280	3280	45.4	16.1
SE side of town N.of WWTF (SS-7)	123598	22,200	4240	84.5	3.1
Brown S. of Curved St.(SS-6)	123597	19,800	2530	84.3	5.26
Brown St. near Boat Launch at park (SS-4)	123594	37,000	10,900	85.6	25.9
Brown St. uphill from Park (SS-5)	123595	12,700	3890	36.6	14.2
Slag Pile (SS-8)	144766	4320	73,000	8.15	1.28
Ditch below (SE) Slag Pile (SS-9)	144767	3660	19,100	423	20.7
West of City Hall near Circle St. (SS-13)	144770	4280	3280	45.4	16.1
W.of Joachim Ave. SE of Main St. (SS-11)	144769	485	166	4.18	4.04
SEDIMENT SAMPLES FROM STREAMS					
Mississippi R. at Doe Run outfall	111731	1710	4920	4.02	7.56
Mississippi R. Mile 145 below Joachim Cr.	111717	11.8	39.4	0.373	5.08
Mississippi R. Mile 146.2 below Joachim Cr.	111718	11.7	49.8	0.237	5.95
Mississippi R. 100 yds. Below Joachim Cr.	111719	21.3	33.6	0.293	4.36
Mississippi R. above Herculaneum	111720	17	50.8	0.326	7.3
Mississippi R. below Meramec R.	111722	13.7	32.6	nd	4.34
Joachim Cr. Above I-55	111723	57.6	161	0.552	10.4
Joachim Cr. Above US-61	111724	144	116	0.625	5
Joachim Cr. Above bridge at slag pile	111725	160	169	1.59	8.48
Joachim Cr. W of slag pile	111726	28.7	46.3	0.277	nd
Joachim Cr. E of slag pile	111727	61.7	192	2.02	9.5
Joachim Cr. E of slag pile at stormwater outfall	111728	62.7	104	0.978	10.9
Joachim Cr. At mouth	111730	136	116	2.09	7.85

nd = non detect

Conclusions:

Major Pb concentrations associated with drainage from haul routes.

Elevated Zn accumulating in drainage below slag pile.

Elevated Pb and Zn found in Mississippi River below Doe Run outfall.

However, metals generally not found accumulating in Mississippi or Joachim Creek.