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JUL 16 2013

**SUPPLEMENTAL SEDIMENT AND WATER QUALITY
CHARACTERIZATION FOR DRUM CREEK
AT FORMER NATIONAL ZINC SITE
CHERRYVALE, MONTGOMERY COUNTY, KANSAS**

Prepared For:

**Kansas Department of Health
& Environment**

January 2005

**ACCEPTED INTO
ADMINISTRATIVE
RECORD FILE**

Prepared By:

**Salomon Smith Barney Holdings, Inc.,
United States Steel Corporation
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BUREAU OF
ENVIRONMENTAL REMEDIATION

BER SCANNED

JUL 16 2013

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Introduction:

Respondents have conducted three previous sampling events covering sediment and water quality in Drum Creek at various water level conditions. The results of these sampling events were presented in the Water Quality and Sediment Sampling Report (April 2004).

By letter dated June 9, 2004 (copy attached as Appendix A), KDHE requested “. . . additional sediment characterization further down-stream in Drum Creek until heavy metal impacts in sediments achieve concentrations at or below TECs or background levels (whichever is higher) as agreed upon by the KDHE-BER project manager.” The KDHE letter further stated that the KDHE project manager desired to be present during sampling activities “. . . to provide oversight as a means to establish consensus and appropriate sampling locations from Drum Creek.”

In response to KDHE’s June 9, 2004 letter, Respondents on or about August 6, 2004 submitted to KDHE a Sampling Plan for Completing Characterization of Downstream Sediment Impacts in Drum Creek (hereinafter referred to as the “Plan”, a copy of which is attached as Appendix B). By letter dated August 24, 2004 (copy attached as Appendix C), KDHE approved the Plan with some requested modifications. By letter dated September 17, 2004 (copy attached as Appendix D), the Respondents agreed to the modifications to the Plan requested by KDHE’s letter of August 24, 2004.

To implement the modified Plan, Altay Ertugrul of A&M Engineering and Environmental Services, Inc. (A&M) made arrangements with the KDHE project manager to remain in close communication, so that both the A&M sampling technician and KDHE project manager, as well as a representative of United States Steel Corporation (USS), could mobilize to the Drum Creek site on short notice to collect the sediment and water quality samples during high water flow conditions as called for in the modified Plan. In a telephone conference between Mr. Ertugrul and the KDHE project manager early the week of October 25, 2004, it was agreed that as a result of on-going rainfall, the desired high water flow conditions would exist on October 27, 2004, and the sediment and water quality samples called for by the modified Plan were therefore collected by A&M on that date with the KDHE project manager and a representative of USS present. The sediment and water samples collected from sample points 4 (low water crossing) and 8 (furthest south sample point) were split between A&M and the KDHE project manager. A & M Engineering subsequently provided a split sample of sediments from sampling point 3 to KDHE for analysis.

Sampling:

The sampling locations are shown on Figure 1 of Appendix B. Sample location 1 is upstream of the City lagoon outfall and was sampled for conformance; it has been sampled during all previous sampling events. Sample point 2 is the City lagoon outfall. Sample point 3 is upstream of the confluence and downstream of the City lagoon outfall. Sample point 4 is at the low water crossing, and points 5, 6, 7 and 8 are downstream of the low water crossing. Sample points 2, 3, 6, 7 and 8 had not been previously sampled. Both sediment and water quality samples were collected at all sample points except point 2, where only a water sample was collected. As noted above, KDHE split samples with A&M at sample points 4 and 8 and A & M Engineering subsequently provided a split sample of sample 3 to KDHE. All sediment/water samples were

analyzed in the field for pH, semi-conductance and temperature. A & M Engineering utilized Green Country Testing, Tulsa, Oklahoma, for analyzing all sediment and water samples. A & M Engineering also provided split samples of the sediment samples from points 3 and 8 to Oklahoma Outreach Laboratories, Broken Arrow, Oklahoma, for analysis.

The analytical results of the sediment sampling are summarized in Table 1 and the analytical results of water quality sampling are summarized in Table 2. The laboratory reports and field sheets are set forth in Appendix E attached hereto. Sediment samples were analyzed for arsenic, cadmium, lead, chromium and zinc. Water samples were analyzed for the same metals plus hardness, field pH, temperature and semi-conductance. Water samples, including the field measurements, were collected directly above the sediment sample locations, for the purpose of facilitating a better understanding of the sediment/water relationship.

Water Sampling Results:

The water samples were analyzed for the five above-referenced metals, plus hardness, pH, temperature, and semi conductance. KDHE obtained split water samples from sampling points 4 and 8. The laboratory data reported by both laboratories (Green Country Testing and KDHE) are summarized in Table 2. All the metal results were below detectable limits. Hardness ranged from 82 to 160 and the pH ranged from 6.45 to 7.81. The pH of the City outfall was 8.14. Because the analytical data showed non-detectable results for all metals of concern, no acute or chronic aquatic life calculations were appropriate. The laboratory water quality reports are included in Appendix E.

Sediment Sampling Results:

There were two sample points (sample points 1 and 3) located upstream of the confluence with Unnamed Creek to establish background levels. Sampling point 3 is used as the benchmark, since it is above the confluence but below the City lagoon outfall. Sampling point 8 represents the furthest downstream conditions.

The following presents a brief description of the procedure utilized by each of the three laboratories (Green Country, Outreach and KDHE), in analyzing the sediment samples from Drum Creek.

Green Country first analyzed samples #1,3,4,5,6,7 and 8 on a wet basis unprocessed. Unprocessed means that any gravel in the sediments larger than 1 centimeter was removed prior to analysis. The samples were then homogenized and acid digested by method 3050B from SW846, 3rd edition. The metals concentrations were determined by method EPA 6010. The results were reported on a wet basis

Green Country repeated the analysis a second time. The same set of samples were homogenized, dried at 30° C ± 4° C and sieved using a USS#10 sieve. Analysis by method 3050B and EPA 6010 was then conducted on the portion of sample that was retained by USS#10 sieve and the portion that passed through the USS#10 sieve. Both results were reported on a dry weight basis.

Outreach analyzed split samples 3 and 8 from the above set. Outreach homogenized the samples, dried them at 30°C ± 4°C and sieved using a USS#10 sieve. Analysis by method 3050B

and EPA 6010 was then conducted only on the portion that passed through the USS#10 sieve. Results were reported on a dried weight basis.

Finally, the KDHE Laboratory analyzed sample numbers 3, 4, and 8 from the same above set of samples. The KDHE Laboratory homogenized the samples, dried them at $30^{\circ}\text{C} \pm 4^{\circ}\text{C}$ and removed gravel in the sediments larger than one centimeter. The samples were then pulverized in a mortar and pestle and acid digested by method 3050B from SW846, 3rd Edition. The total metals concentrations were determined by method EPA6010. The results were reported on a dry weight basis.

It is important to point out that the KDHE Laboratory pulverized the dried sediments samples prior to acid digest and the other two laboratories, Green Country and Outreach did not. By pulverizing the sediment samples, one increases its surface area during digesting, thus increasing its metal ion concentrations. This explains why the overall results of the KDHE Laboratory are higher in concentration than the other two laboratories. In the Respondents' opinion the KDHE methodology used in preparing and analyzing the sediment samples does not represent the accurate metal concentrations and the actual leachability conditions that exist in the creek bed.

Table 3 presents a comparison of background sediment samples (sample 3) with the following downstream sediment samples: sample 8 (the furthest downstream sample), sample 4 (the low water crossing) and the average of samples 4, 5, 6, and 7. The data compared in table 3 includes the wet unprocessed analysis data developed by Green Country, the dry basis pulverized data, developed by KDHE Laboratory, and the dry basis sieved data developed by Outreach.

The purpose of obtaining both sediment and water samples simultaneously from each sample point was to establish the impact of metals in sediments on water quality during high flow conditions. Considering the purpose of the sampling plan, Respondents believe that the dry basis analysis of sediments does not represent the accurate metal concentrations and leachability conditions for direct comparison with the water quality data. Therefore, in the Respondents' opinion, the analysis of wet and unprocessed samples is closest to the actual conditions of sediments in the creek bed and provides the most accurate representation of the existing Drum Creek conditions during high flow.

Referring to Tables 1 and 3 and comparing samples point 3, which represents the background condition, with the other downstream sample points, the following observations can be made:

- On a wet unprocessed analysis basis, the metal levels at sample point 8 (the furthest downstream sample point) are less than the background level (sample 3) for all of the parameters with the exception of zinc. Since zinc is a secondary element, it is not characteristically considered toxic under 40 CFR part 261.24.

Table 3 shows that the arsenic level at sample point 8 is 23.2mg/kg. (51.3%), less than the background level at sample point 3, cadmium is 1.7mg/kg. (15.3%) less than the background level at sample point 3, chromium is 15.6mg/kg. (49.7%), less than the background level at sample point 3, and lead is 22.8mg/kg. (41%), less than the background level at sample point 3. The zinc level at sample point 8 is 174 mg/kg. (58.2%), higher than the background level at sample point 3.

- On a wet unprocessed analysis basis, the metal levels at sample point 4 (at low water crossing) are less than the background level for arsenic, chromium, and lead and slightly higher than the background level for cadmium and zinc. See Table 3.
- On a wet unprocessed analysis basis, the metal levels for the average of sample points 4, 5, 6, and 7 (the four locations north of the furthest downstream sample point 8) are less than the background for arsenic and chromium, and slightly higher than the background level for lead, cadmium and zinc. See Table 3.
- On a dry pulverized basis of analysis, the metal levels at sample point 8 (the furthest downstream sample) and sample point 4 (the low water crossing), when compared with background levels at sample point 3, showed a decrease in arsenic and chromium concentrations, and a slight increase in cadmium, lead and zinc concentrations. See Table 3.
- On a dry unpulverized but sieved basis of analysis, all parameters except zinc are substantially the same at sample points 8 and 3; zinc is somewhat higher. See Table 1.

Water Quality Conclusions:

Both KDHE and Green Country Testing water quality analysis show that any heavy metals contained in or attached to the sediments in Drum Creek are not leaching into the water. The water quality in Drum Creek is not impacted by the sediments, even during high flow conditions.

Sediment Sampling Conclusions:

On a wet basis unprocessed, which is believed to be most representative of site conditions, the concentration of all metals at sample point 3, above the confluence but below the City lagoon outfall, is either higher than or comparable to the levels at the other downstream sampling points. As a further general proposition, the concentration of all metals at sample point 1, above the City lagoon outfall, is either higher than or comparable to the levels at sample point 8, the furthest sample point downstream. Lastly, there is a dramatic decrease in all metals between the levels of sample point 7 and those downstream at sample point 8. The data from other methods of analysis, while not entirely uniform, does not weaken the validity of the wet basis unprocessed data, particularly in light of the water quality data which shows no metal impacts even during high flow. Therefore, it is submitted that the October 27, 2004 sampling has established that from the low water dam downstream, "heavy metal impacts in sediments [have been shown to be at] concentrations at or below TECs or background levels (whichever is higher)".

Table 1

Summary of Sediment Sampling Results for Drum Creek

Sample ID	Parameter	Green Country Testing	Green Country Testing	Green Country Testing	Outreach Laboratories	KDHE	
		Wet Basis - Unprocessed (mg/Kg)	Dried Basis - Passed #10 Sieve (mg/Kg)	Dried Basis - Retained #10 Sieve (mg/Kg)	Dried Basis - Passed #10 Sieve (mg/Kg)	Dried Crushed - No Sieve (mg/Kg)	
#8 (10/27/04)	Arsenic	22	35.7		26.9	57.1	95
	Cadmium	9.4	15.2		6.17	21.5	17
	Chromium	15.8	38		22.2	31.2	52
	Lead	32.8	94.9		34.4	86.4	78
	Zinc	473	1220		639	1010	1200
#3 (10/27/04)	Arsenic	45.2	34.6		24.1	55	100
	Cadmium	11.1	5.8		6.11	13.6	5.4
	Chromium	31.4	35.4		26.3	35.4	55
	Lead	55.5	45.4		35	72.8	55
	Zinc	299	193		128	320	290
#4 (10/27/04)	Arsenic	30.8	38.7		31.3		84
	Cadmium	12.8	13.5		12.5		28
	Chromium	25.6	43.1		27.2		46
	Lead	52.3	69.5		52.2		82
	Zinc	485	934		776		2500
#1 (10/27/04)	Arsenic	23.7	23.6		24.1		
	Cadmium	4.58	2.4		3		
	Chromium	23.4	27.2		23.4		
	Lead	25.2	24.9		32.1		
	Zinc	78	101		143		
#5 (10/27/04)	Arsenic	30.5	66		42		
	Cadmium	16.5	17.1		14.9		
	Chromium	28.7	46		32.9		
	Lead	50.6	94.5		142		
	Zinc	854	1350		961		
#6 (10/27/04)	Arsenic	37.6	67.7		44.6		
	Cadmium	15.3	9.93		11.8		
	Chromium	36.4	33.8		24.3		
	Lead	75.8	59.3		41.9		
	Zinc	835	706		707		
#7 (10/27/04)	Arsenic	55.3	39		22.7		
	Cadmium	22.7	13.8		12.1		
	Chromium	24.7	31.4		24.4		
	Lead	56.1	52.5		38.7		
	Zinc	1130	694		638		

Table 2
Water Quality Sampling Results

	Arsenic (mg/L)	Lead (mg/L)	Cadmium (mg/L)	Chromium (mg/L)	Zinc (mg/L)	pH (S.U.)	Semi Conductance (µmho/cm)	Temperature (°C)	Hardness (mg/L)
Green Country Testing Results									
Sample Point 1	BDL	BDL	BDL	BDL	BDL	7.59	270	21.1	82
Sample Point 2	BDL	BDL	BDL	BDL	BDL	8.14	630	21.6	160
Sample Point 3	BDL	BDL	BDL	BDL	BDL	7.15	280	20.9	86
Sample Point 4	BDL	BDL	BDL	BDL	BDL	6.45	570	19.6	120
Sample Point 5	BDL	BDL	BDL	BDL	BDL	7.81	350	20.3	120
Sample Point 6	BDL	BDL	BDL	BDL	BDL	7.64	400	20.2	120
Sample Point 7	BDL	BDL	BDL	BDL	BDL	7.45	360	20.3	120
Sample Point 8	BDL	BDL	BDL	BDL	BDL	7.43	590	21.6	140
KDHE Laboratory Results									
Sample Point 4	BDL	BDL	BDL	BDL	BDL	N/A	N/A	N/A	N/A
Sample Point 8	BDL	BDL	BDL	BDL	BDL	N/A	N/A	N/A	N/A

Note: BDL indicates "Below Detection Limit" (See Laboratory Reports for Detection Limits in Appendix E)
N/A indicates "Not Available"

Table 3

Comparison of Background Metal Concentrations with Downstream Metal Concentrations from Sediment Samples Collected in Drum Creek

Analysis by Green Country Testing			
Wet Basis - Unprocessed			
Parameter	Background to Sample 8 (mg/Kg)	Background to Sample 4 (mg/Kg)	Background to Average of Samples 4,5,6,7 (mg/Kg)
Arsenic	-23.2	-14.4	-6.65
Cadmium	-1.7	+1.7	+5.7
Chromium	-15.6	-5.8	-2.6
Lead	-22.7	-3.2	+3.2
Zinc	+174	+186	+527
Analysis by KDHE Environmental Laboratories			
Dry Basis - Pulverized			
Parameter	Background to Sample 8 (mg/Kg)	Background to Sample 4 (mg/Kg)	Background to Average of Samples 4,5,6,7 (mg/Kg)
Arsenic	-5	-16	N/A
Cadmium	+11.6	+22.6	N/A
Chromium	-3	-9	N/A
Lead	+23	+27	N/A
Zinc	+910	+2210	N/A

Note: Samples preceded by minus sign "-" are less than the background
 Samples preceded by plus sign "+" are greater than the background
 Background Sample is Sample Point #3

**APPENDIX A
(JUNE 9, 2004 LETTER)**



K A N S A S

RODERICK L. BREMBY, SECRETARY

DEPARTMENT OF HEALTH AND ENVIRONMENT

KATHLEEN SEBELIUS, GOVERNOR

June 9, 2004

William C. Anderson
Doerner, Saunders, Daniel & Anderson, L.L.P.
320 South Boston Avenue, Suite 500
Tulsa, OK 74103-3725

David L. Smiga
United States Steel Corporation
600 Grant Street, Room 1500
Pittsburgh, PA 15219-2800

RE: Former National Zinc Site, Cherryvale, Kansas

Dear Messrs. Anderson and Smiga:

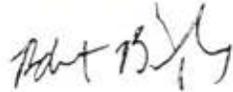
This letter is in response to the May 24, 2004 United States Steel Corporation (US Steel) correspondence to Leo Henning, Kansas Department of Health and Environment–Bureau of Environmental Remediation (KDHE–BER). KDHE-BER understands the Respondents have determined not to perform a biological assessment of Drum Creek as requested by the Trustees for the State of Kansas. KDHE-BER would like to stress their desire to continue to work cooperatively with the Respondents to address lead, cadmium, and arsenic impacts in soil and sediments associated with the Former National Zinc Site. In particular, KDHE-BER requires completion of the characterization of down-stream sediment impacts in Drum Creek. From the October 2003 *Analytical Report - Surface Water, Sediment, and EPA Repository Soil Sampling for Former National Zinc Site*, analytical data from sediment sampling 6000 feet down-stream indicated lead, zinc, and arsenic concentrations exceeding the Consensus-Based Threshold Effect Concentrations (TECs) identified by KDHE as screening level characterization goals. Consequently, KDHE-BER requests additional sediment characterization further down-stream in Drum Creek until heavy metal impacts in sediments achieve concentrations at or below TECs or background levels (whichever is higher) as agreed upon by the KDHE-BER project manager. Additionally, the KDHE-BER project manager would like to be present on-site during sediment sampling activities to provide oversight as a means to establish consensus and appropriate sampling locations from Drum Creek.

KDHE-BER hereby requests the submittal of the Removal Action (RA) Plan within thirty days from the date of this letter to address on-site soil and sediment impacts as well as sediment impacts identified in Unnamed Creek. KDHE-BER would like to discuss remedial options for Drum Creek following the completion of down-stream sampling.

DIVISION OF ENVIRONMENT
Bureau of Environmental Remediation
CURTIS STATE OFFICE BUILDING, 1000 SW JACKSON ST., STE 410, TOPEKA, KS 66612-1367
Phone: 785-296-1673 Fax: 785-296-7030 <http://www.kdhe.state.ks.us>
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Should you have any questions, you may reach me by telephone at 785-296-6437 or by e-mail at rbixby@kdhe.state.ks.us.

Sincerely,



Robert Bixby
Environmental Scientist
Remedial Section
Bureau of Environmental Remediation

- a: Kurt Limesand → file National Zinc, Cherryvale (C3-063-00026-01)
Erika Bessey, KDHE Legal
Charles N. Wentz, United States Steel Corporation
Altay M. Ertugrul, A&M Engineering & Environmental Services, Inc.
Leo Henning, KDHE

APPENDIX B (SAMPLING PLAN)

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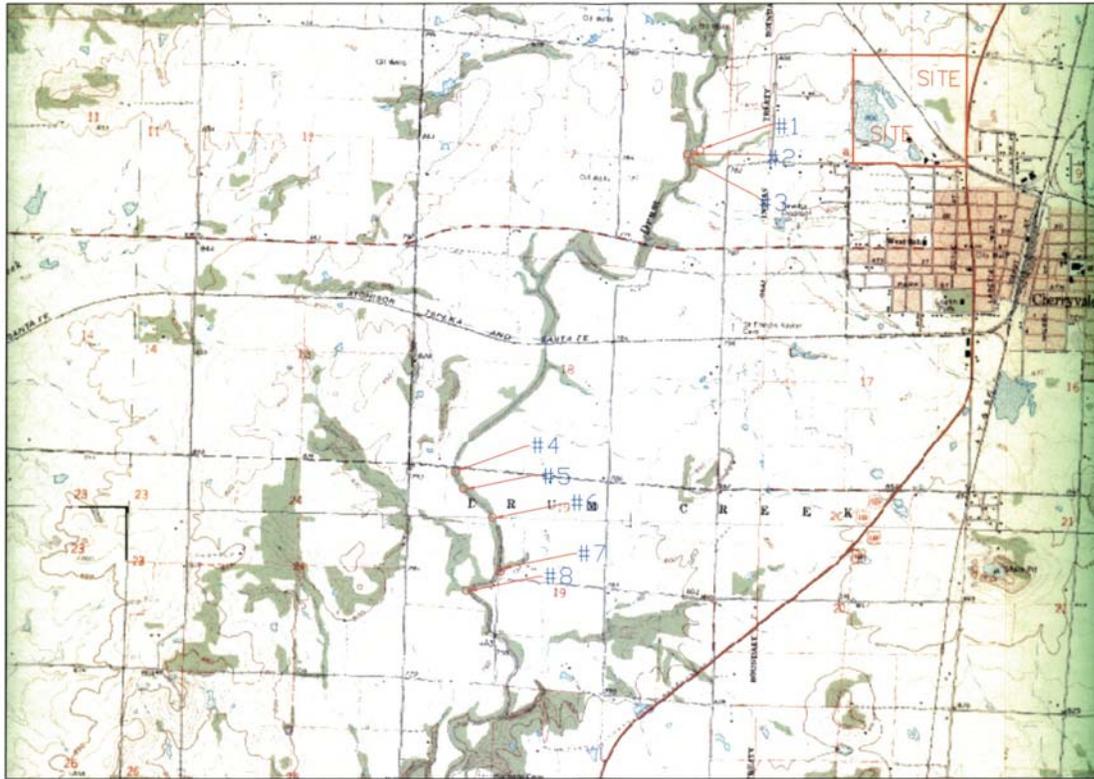
SAMPLING PLAN FOR COMPLETING CHARACTERIZATION OF DOWN- STREAM SEDIMENT IMPACTS IN DRUM CREEK

Respondents U.S. Steel Corporation, and Salomon Smith Barney Holdings, Inc. have previously conducted sediment sampling in Drum Creek during 2003 and early 2004. The sampling results are summarized in the following reports submitted by Respondents to KDHE: 1) Analytical Report: Surface Water, Sediment, and EPA Repository Soil Sampling (October 2003), and 2) Water Quality and Sediment Sampling Report (April 2004). Additionally, the Drum Creek sediment sampling results were discussed and analyzed in the Remedial Action Design Report (July 2004), recently submitted by Respondents to KDHE.

By letter dated June 9, 2004, KDHE requested that Respondents conduct "additional sediment characterization further down-stream in Drum Creek until heavy metal impacts in sediments achieve concentrations at or below TECs or background levels (whichever is higher) as agreed upon by the KDHE-BER project manager". This Sampling Plan is submitted in response to KDHE's request.

Sampling Locations

As set forth below, Respondents propose to conduct the additional sediment sampling requested by KDHE during high flow conditions. The proposed sampling points are shown on the attached Figure 1.



LEGEND
 ○ = PROPOSED SAMPLE LOCATIONS

SCALE



GENERAL NOTES

REVISIONS

NO.	DESCRIPTION	BY	DATE	NO.	DESCRIPTION	BY	DATE



SAMPLE LOCATIONS
 DRUM CREEK, CHERRYVALE, KANSAS

DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION
9/14/04	AME	DATE	9/14/04	AME	DATE	9/14/04	AME	DATE

FIGURE 1 (REVISED)

At sample point 1 (the low water crossing), the sediment has previously been sampled during low flow conditions, and the water quality sampled during low, normal and high flows. At sample point 2 (300 feet down-stream from the low water crossing), the sediment has previously been sampled during high flow conditions, and the water quality sampled during high and normal flow conditions. The sediment and water quality at sample points 3, 4 and 5 have not previously been sampled under any flow conditions.

The proposed sample locations 1 through 5 have been selected at approximately equidistant intervals to span a total stream segment of approximately one half mile. It is believed that sampling over this distance will be sufficient to establish the down-stream boundary of heavy metal impacts to sediments.

It is proposed to sample for both sediment and water quality at all five sample points.

The sampling at points 1 and 2 will be for confirmation and continuity purposes, and to obtain comparative data under the same conditions that samples are taken from points 3, 4 and 5. Additionally, at sample point 1, the sediment has not previously been sampled during high flow conditions.

GPS positioning coordinates for the sampling points have been located in the field during very low flow conditions, so that they can be located by the GPS tracking device for sampling during high flow conditions.

Sampling Time

The sampling will take place during high flow conditions. It is likely that such conditions will occur on short notice. KDHE will be notified as far in advance as possible when high flow conditions will be present for sampling, so that KDHE representatives can be present to observe the sampling according to the procedures outlined below. As noted above, since the sampling locations will be difficult to locate during high flow conditions, a GPS tracking device will be utilized to locate the sampling points in the field.

SAMPLING PROCEDURES

Sediment Sampling

Nitrile or equivalent gloves will be used during sample collection. A core sample from the upper six inches of sediment will be collected and placed in a pre-cleaned stainless steel mixing bowl. The sample will be mixed using a stainless steel spoon or spatula. The sample will be collected in a 250 ml plastic coated glass jar, labeled, and after completing a chain-of-custody, the sample will be placed in a cooler for transport. The sediment will be analyzed for total metals for the following: Arsenic, Lead, Cadmium, Zinc, and Chromium (EPA Method 610.B).

The stainless steel collecting apparatus will be cleaned with an Alconox soap solution and triple rinsed between sampling events. A sample of the rinsate will be collected, retained and shipped to the lab for equal analysis after the first sample to determine the efficiency of decontamination procedures.

Water Sampling

Water samples will be collected via a 12V Geosquirt pump and filtered in the field through a Geotech .45 micron high capacity disposable filter. The precleaned pump will have one gallon of distilled water pumped through the pump. During this time an equipment blank will be collected and analyzed in the lab for equal parameters, excluding hardness. All sample bottles will be lab certified clean and obtained from Green Country Testing in Tulsa, Oklahoma.

Clean nitrile or equivalent gloves shall be worn during sampling. The pump shall be placed midway between the bottom and surface of the water depth. A .45 micron filter will be attached to the end of the hose. The sample will be collected in a 1000 ml unpreserved plastic bottle. The sample will be labeled, a chain-of-custody completed, and the sample will be placed on ice for transport to the lab. The pump will be decontaminated using Alconox soap solution and pumping 2 gallons of distilled water through the pump between each sampling event. A new filter will be used at each sampling location. The samples will be analyzed for total Arsenic, Lead, Zinc, Cadmium, Chromium (EPA method 610.B) and total hardness (EPA Method 130.2).

**APPENDIX C
(AUGUST 24, 2004 LETTER)**



K A N S A S

RODERICK L. BREMBY, SECRETARY

KATHLEEN SEBELIUS, GOVERNOR

DEPARTMENT OF HEALTH AND ENVIRONMENT

August 24, 2004

William C. Anderson
Doerner, Saunders, Daniel & Anderson, L.L.P.
320 South Boston Avenue, Suite 500
Tulsa, OK 74103-3725

David L. Smiga
United States Steel Corporation
600 Grant Street, Room 1500
Pittsburgh, PA 15219-2800

RE: Former National Zinc Site, Cherryvale, Kansas

Dear Messrs. Anderson and Smiga:

The Kansas Department of Health and Environment (KDHE) has reviewed the document entitled, "Sampling Plan for Completing Characterization of Down-stream Sediment Impacts in Drum Creek," received by KDHE August 6, 2004. The report was submitted by A&M Engineering and Environmental Services, Inc. (A&M) on behalf of the Respondents, United States Steel Corporation and Salomon Smith Barney Holdings, Inc. This letter serves as a "Notice of Approval" for the Sampling Plan for Completing Characterization of Down-stream Sediment Impacts in Drum Creek (Sampling Plan) with the following considerations:

- ▶ The locations of sampling points 1 and 2 have been previously sampled during low flow and high flow conditions, respectively. As proposed in the Sampling Plan, sampling at points 1 and 2 will be for confirmation and continuity purposes. KDHE suggests that one or more background sample be collected up-gradient of the confluence to confirm the increased Lead and Chromium concentrations observed during the January 2004 sampling of high flow conditions.
- ▶ KDHE recommends analysis for pH of the surface water over the sediments to possibly identify any unusual pH conditions that would influence contaminant mobility and retention by the sediments.
- ▶ KDHE requests that Figure 1: Proposed Sample Locations, be modified to include the location of the former National Zinc Site in relation to the proposed sample locations.

Messrs. Anderson and Smiga
August 24, 2004

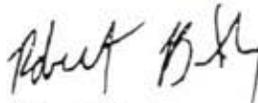
Page 2

The KDHE project manager would like to be present on-site during sediment sampling activities to provide oversight as a means to establish consensus and appropriate sampling locations from Drum Creek and understands that A&M will be contacting the KDHE project manager on short notice to perform sediment characterization activities when high flow conditions are expected to be present. In order to accommodate the needs of the Respondents to sample on short notice, the KDHE project manager intends to be as flexible and scheduling permits.

Should the comments provided above be acceptable to the Respondents, please consider this letter to be a "Notice of Approval" to initiate down-stream sediment characterization activities as soon as high flow conditions are expected. KDHE looks forward to discussing remedial options for Drum Creek following the completion of down-stream sampling.

Should you have any questions, you may reach me by telephone at 785-296-6437 or by e-mail at rbixby@kdhe.state.ks.us.

Sincerely,



Robert Bixby
Geologist/Hydrologist
Remedial Section
Bureau of Environmental Remediation

- a: Kurt Limesand → file National Zinc, Cherryvale (C3-063-00026-01)
Mark Rupnow, United States Steel Corporation
Altay M. Ertugrul, A&M Engineering & Environmental Services, Inc.
Leo Henning, KDHE

APPENDIX D
(SEPTEMBER 17, 2004 LETTER)

DOERNER, SAUNDERS, DANIEL & ANDERSON, L.L.P.
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OF COUNSEL:
MICHAEL MENNIS & ASSOCIATES, P.C.
MICHAEL MENNIS
DAVID McCULLOUGH

E. J. DOERNER (1897-1985)
DICKSON M. SAUNDERS (1920-2001)

September 17, 2004

VIA FACSIMILE AND U.S. MAIL

Mr. Robert Bixby
Geologist/Hydrologist/Remedial Section
Bureau of Environmental Remediation (BER)
Kansas Department of Health & Environment
1000 Southwest Jackson, Suite 410
Topeka, Kansas 66612-1367

RE: Former National Zinc Site, Cherryvale, Kansas

Dear Mr. Bixby:

We have received your letter dated August 24, 2004 which approved the Sampling Plan submitted to KDHE on August 6, 2004 for completing the characterization of downstream sediment impacts in Drum Creek. In your approval letter you list several recommendations to be considered by the Respondents. The following presents a list of your recommendations and of the Respondents' response to each of the recommendations.

Recommendation: The locations of sampling points 1 and 2 have been previously sampled during low flow and high flow conditions, respectively. As proposed in the Sampling Plan, sampling at points 1 and 2 will be for confirmation and continuity purposes. KDHE suggests that one or more background samples be collected upgradient of the confluence to confirm the increased Lead and Chromium concentrations observed during the January 2004 sampling of high flow conditions.

Response: The Respondents will collect two background sediment and water samples from new sample points 1 and 3 and a water sample from the new City outfall at new sample point 2, as shown on the enclosed Revised Figure 1. New sample point 1 is a previously sampled

upstream point above the new City outfall. New sample point 2 is at the City outfall. New sample point 3 is upstream of the confluence and downstream of the new City outfall.

Recommendation: KDHE recommends analysis for pH of the surface water over the sediments to possibly identify any unusual pH conditions that would influence contaminant mobility and retention by the sediments.

Response: The Respondents will analyze the pH of the water above the sediment sampling locations using an Orion Model 32A pH probe.

Recommendation: KDHE requests that a Figure 1, Proposed Sample Locations, be modified to include the location of the former National Zinc Site in relation to the proposed sample locations.

Response: A Revised Figure 1 showing the location of the former National Zinc Site in relation to the proposed sampling locations is enclosed.

If you have any questions, please call me or Altay Ertugrul.

Sincerely,



William C. Anderson of
DOERNER, SAUNDERS, DANIEL & ANDERSON, L.L.P.

WCA/sm

Enclosure

cc: Rick Bean (w/encl.) - Via U.S. Mail
Kurt Limesand (w/encl.) - Via U.S. Mail
Erika Bessey, Esq. (w/encl.) - Via U.S. Mail
Ellen O'Brien, Esq. (w/encl.) - Via U.S. Mail
David Smiga, Esq. (w/encl.) - Via U.S. Mail
Rick Menozzi (w/encl.) - Via U.S. Mail
Mark Rupnow (w/encl.) - Via U.S. Mail
Altay Ertugrul (w/encl.) - Via U.S. Mail

**APPENDIX E
(LABARATORY REPORTS)**

51



CLIENT: A & M Engineering
 Lab Order: T04100305
 Project: Cherryvale Drum Creek

Date Received: 10/28/2004
 Date Reported: 01-Nov-04

Lab ID: T04100305-01 Collection Date: 10/27/2004 12:15:00 P Sample ID: #8

Matrix: SOLID

<u>Analyses</u>	<u>Result</u>	<u>Detection Limit</u>	<u>Units</u>	<u>Date Analyzed</u>	<u>Analyst</u>
METALS IN SOIL OR SLUDGE BY ICP		SW6010A			KR
Arsenic	22.0	0.500	mg/Kg	10/29/2004	
Cadmium	9.40	0.250	mg/Kg	10/29/2004	
Chromium	15.8	0.250	mg/Kg	10/29/2004	
Lead	32.8	0.125	mg/Kg	10/29/2004	
Zinc	473	2.50	mg/Kg	10/29/2004	

Lab ID: T04100305-02 Collection Date: 10/27/2004 11:30:00 A Sample ID: #4

Matrix: SOLID

<u>Analyses</u>	<u>Result</u>	<u>Detection Limit</u>	<u>Units</u>	<u>Date Analyzed</u>	<u>Analyst</u>
METALS IN SOIL OR SLUDGE BY ICP		SW6010A			KR
Arsenic	30.8	0.500	mg/Kg	10/29/2004	
Cadmium	12.8	0.250	mg/Kg	10/29/2004	
Chromium	25.6	0.250	mg/Kg	10/29/2004	
Lead	52.3	0.125	mg/Kg	10/29/2004	
Zinc	485	2.50	mg/Kg	10/29/2004	

Lab ID: T04100305-03 Collection Date: 10/27/2004 1:55:00 P Sample ID: #1

Matrix: SOLID

<u>Analyses</u>	<u>Result</u>	<u>Detection Limit</u>	<u>Units</u>	<u>Date Analyzed</u>	<u>Analyst</u>
METALS IN SOIL OR SLUDGE BY ICP		SW6010A			KR
Arsenic	23.7	0.500	mg/Kg	10/29/2004	
Cadmium	4.58	0.250	mg/Kg	10/29/2004	
Chromium	23.4	0.250	mg/Kg	10/29/2004	
Lead	25.2	0.125	mg/Kg	10/29/2004	
Zinc	78.0	0.250	mg/Kg	10/29/2004	



CLIENT: A & M Engineering
 Lab Order: T04100305
 Project: Cherryvale Drum Creek

Date Received: 10/28/2004
 Date Reported: 01-Nov-04

Lab ID: T04100305-04 Collection Date: 10/27/2004 2:35:00 P Sample ID: #3

Matrix: SOLID

<u>Analyses</u>	<u>Result</u>	<u>Detection Limit</u>	<u>Units</u>	<u>Date Analyzed</u>	<u>Analyst</u>
METALS IN SOIL OR SLUDGE BY ICP	SW6010A				KR
Arsenic	45.2	0.500	mg/Kg	10/29/2004	
Cadmium	11.1	0.250	mg/Kg	10/29/2004	
Chromium	31.4	0.250	mg/Kg	10/29/2004	
Lead	55.5	0.125	mg/Kg	10/29/2004	
Zinc	299	2.50	mg/Kg	10/29/2004	

Lab ID: T04100305-05 Collection Date: 10/27/2004 5:00:00 P Sample ID: #5

Matrix: SOLID

<u>Analyses</u>	<u>Result</u>	<u>Detection Limit</u>	<u>Units</u>	<u>Date Analyzed</u>	<u>Analyst</u>
METALS IN SOIL OR SLUDGE BY ICP	SW6010A				KR
Arsenic	30.5	0.500	mg/Kg	10/29/2004	
Cadmium	16.5	0.250	mg/Kg	10/29/2004	
Chromium	28.7	0.250	mg/Kg	10/29/2004	
Lead	50.6	0.125	mg/Kg	10/29/2004	
Zinc	854	2.50	mg/Kg	10/29/2004	

Lab ID: T04100305-06 Collection Date: 10/27/2004 4:00:00 P Sample ID: #6

Matrix: SOLID

<u>Analyses</u>	<u>Result</u>	<u>Detection Limit</u>	<u>Units</u>	<u>Date Analyzed</u>	<u>Analyst</u>
METALS IN SOIL OR SLUDGE BY ICP	SW6010A				KR
Arsenic	37.6	0.500	mg/Kg	10/29/2004	
Cadmium	15.3	0.250	mg/Kg	10/29/2004	
Chromium	36.4	0.250	mg/Kg	10/29/2004	
Lead	75.8	0.125	mg/Kg	10/29/2004	
Zinc	835	2.50	mg/Kg	10/29/2004	



CLIENT: A & M Engineering
Lab Order: T04100305
Project: Cherryvale Drum Creek

Date Received: 10/28/2004
Date Reported: 01-Nov-04

Lab ID: T04100305-07 Collection Date: 10/27/2004 4:35:00 P Sample ID: #7

Matrix: SOLID

<u>Analyses</u>	<u>Result</u>	<u>Detection Limit</u>	<u>Units</u>	<u>Date Analyzed</u>	<u>Analyst</u>
METALS IN SOIL OR SLUDGE BY ICP		SW6010A			KR
Arsenic	55.3	0.500	mg/Kg	10/29/2004	
Cadmium	22.7	0.250	mg/Kg	10/29/2004	
Chromium	24.7	0.250	mg/Kg	10/29/2004	
Lead	56.1	0.125	mg/Kg	10/29/2004	
Zinc	1,130	2.50	mg/Kg	10/29/2004	



CLIENT: A & M Engineering
 Work Order: T04100305
 Project: Cherryvale Drum Creek

QC SUMMARY REPORT

TestCode	Analyte	BatchID	QCType	Result	PQL	Units	%Rec	%RPD
MET_S_ICP	Arsenic	2212	MBLK	< 0.50	0.5	mg/Kg		
	Arsenic	2213	MBLK	< 0.50	0.5	mg/Kg		
	Cadmium	2212	MBLK	< 0.25	0.25	mg/Kg		
	Cadmium	2213	MBLK	< 0.25	0.25	mg/Kg		
	Chromium	2212	MBLK	< 0.25	0.25	mg/Kg		
	Chromium	2213	MBLK	< 0.25	0.25	mg/Kg		
	Lead	2212	MBLK	< 0.12	0.125	mg/Kg		
	Lead	2213	MBLK	< 0.12	0.125	mg/Kg		
	Zinc	2212	MBLK	< 0.25	0.25	mg/Kg		
	Zinc	2213	MBLK	< 0.25	0.25	mg/Kg		
	Arsenic	2212	LCS	181.9	0.5	mg/Kg	91	0.707
	Arsenic	2212	LCS	183.2	0.5	mg/Kg	91.6	
	Arsenic	2213	LCS	180.8	0.5	mg/Kg	90.4	0.105
	Arsenic	2213	LCS	181	0.5	mg/Kg	90.5	
	Cadmium	2212	LCS	187.7	0.25	mg/Kg	93.8	
	Cadmium	2212	LCS	186.6	0.25	mg/Kg	93.3	0.593
	Cadmium	2213	LCS	187.5	0.25	mg/Kg	93.7	1.7
	Cadmium	2213	LCS	184.3	0.25	mg/Kg	92.2	
	Chromium	2212	LCS	191.8	0.25	mg/Kg	95.9	
	Chromium	2212	LCS	191.5	0.25	mg/Kg	95.8	0.13
	Chromium	2213	LCS	191.6	0.25	mg/Kg	95.8	
	Chromium	2213	LCS	192.5	0.25	mg/Kg	96.3	0.51
	Lead	2212	LCS	187	0.125	mg/Kg	93.5	0.0321
	Lead	2212	LCS	187	0.125	mg/Kg	93.5	
	Lead	2213	LCS	187.1	0.125	mg/Kg	93.5	
	Lead	2213	LCS	187.2	0.125	mg/Kg	93.6	0.0748
	Zinc	2212	LCS	185	0.25	mg/Kg	92.5	
	Zinc	2212	LCS	184.2	0.25	mg/Kg	92.1	0.422
	Zinc	2213	LCS	185.1	0.25	mg/Kg	92.6	0.542
	Zinc	2213	LCS	184.1	0.25	mg/Kg	92.1	
	Arsenic	2212	MS	177.6	0.5	mg/Kg	88.8	
	Arsenic	2213	MS	177.8	0.5	mg/Kg	88.9	
	Cadmium	2212	MS	182.4	0.25	mg/Kg	91.2	
	Cadmium	2213	MS	181	0.25	mg/Kg	90.5	
	Chromium	2212	MS	187.2	0.25	mg/Kg	93.6	
	Chromium	2213	MS	185.8	0.25	mg/Kg	92.9	
	Lead	2212	MS	485.3	0.125	mg/Kg	88.9	
	Lead	2213	MS	356.2	0.125	mg/Kg	86	
	Zinc	2212	MS	180.4	0.25	mg/Kg	90.2	
	Zinc	2213	MS	178.8	0.25	mg/Kg	89.4	
	Arsenic	2212	MSD	177.8	0.5	mg/Kg	88.9	0.0982
	Arsenic	2213	MSD	179	0.5	mg/Kg	89.5	0.676
	Cadmium	2212	MSD	183.1	0.25	mg/Kg	91.6	0.387
	Cadmium	2213	MSD	185	0.25	mg/Kg	92.5	2.16
	Chromium	2212	MSD	187.6	0.25	mg/Kg	93.8	0.217
	Chromium	2213	MSD	188.7	0.25	mg/Kg	94.3	1.53

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TESTING

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CLIENT: A & M Engineering
Work Order: T04100305
Project: Cherryvale Drum Creek

QC SUMMARY REPORT

TestCode	Analyte	BatchID	QCType	Result	PQL	Units	%Rec	%RPD
	Lead	2212	MSD	483.4	0.125	mg/Kg	87.9	0.404
	Lead	2213	MSD	361.2	0.125	mg/Kg	88.5	1.39
	Zinc	2212	MSD	181.1	0.25	mg/Kg	90.6	0.429
	Zinc	2213	MSD	184.2	0.25	mg/Kg	92.1	2.94



Tony Mummolo
A & M Engineering
10010 E. 16th St.
Tulsa, OK 74128-4813
TEL: (918)665-6574
FAX (918) 665-6576

December 08, 2004
Order No.: T04120072

RE: Cherryvale

Dear Tony Mummolo:

Green Country Testing, Inc. received 14 samples on 12/7/2004 for the analyses presented in the following report.

In accordance with your instructions, Green Country Testing conducted the analysis shown on the following pages on samples submitted by your company. The results related only to the items tested. Unless otherwise noted, all analysis was conducted using EPA approved methodologies. Test reports meet all the NELAC requirements. All relevant sampling information is on the attached chain-of-custody form. The initials SUB as the analyst designate any testing sub-contracted by Green Country Testing.

Certifications/Accreditation: OK - 7604
AR - ADEQ
KS - E-10232
LA - 4002

A scope of Certified/Accredited parameters is available upon request. If you have any questions regarding these tests results, please feel free to call.

Sincerely,

Brian Duzan

Approved By: _____


Brian Duzan, Director
Environmental Services



CLIENT: A & M Engineering
 Lab Order: T04120072
 Project: Cherryvale

Date Received: 12/7/2004
 Date Reported: 08-Dec-04

Lab ID: T04120072-01 Collection Date: 10/27/2004 Sample ID: #8 Passed #10

Matrix: SOLID

<u>Analyses</u>	<u>Result</u>	<u>Detection Limit</u>	<u>Units</u>	<u>Date Analyzed</u>	<u>Analyst</u>
METALS IN SOIL OR SLUDGE BY ICP					
					KR
	SW6010A				
Arsenic	35.7	0.500	mg/Kg	12/3/2004	
Cadmium	15.2	0.250	mg/Kg	12/3/2004	
Chromium	38.0	0.250	mg/Kg	12/3/2004	
Lead	94.9	0.125	mg/Kg	12/3/2004	
Zinc	1,220	2.50	mg/Kg	12/3/2004	
SIEVE ANALYSIS					
					JF
	ASTM D422				
% Passed through #10 Sieve	12.80	0.10	wt%	12/2/2004	
% Retained by #10 Sieve	87.20	0.10	wt%	12/2/2004	
Sieve Analysis	100.00	0.010	wt%	12/2/2004	
PERCENT SOLIDS					
					JF
	E160.3				
Percent Solids	86.9	0.100	wt%	11/24/2004 2:00:0	

Lab ID: T04120072-02 Collection Date: 10/27/2004 Sample ID: #8 Retained by #10

Matrix: SOLID

<u>Analyses</u>	<u>Result</u>	<u>Detection Limit</u>	<u>Units</u>	<u>Date Analyzed</u>	<u>Analyst</u>
METALS IN SOIL OR SLUDGE BY ICP					
					KR
	SW6010A				
Arsenic	26.9	0.500	mg/Kg	12/3/2004	
Cadmium	6.17	0.250	mg/Kg	12/3/2004	
Chromium	22.2	0.250	mg/Kg	12/3/2004	
Lead	34.4	0.125	mg/Kg	12/3/2004	
Zinc	639	2.50	mg/Kg	12/3/2004	



CLIENT: A & M Engineering
 Lab Order: T04120072
 Project: Cherryvale

Date Received: 12/7/2004
 Date Reported: 08-Dec-04

Lab ID: T04120072-05 Collection Date: 10/27/2004

Sample ID: #1 Passed by #10

Matrix: SOLID

<u>Analyses</u>	<u>Result</u>	<u>Detection Limit</u>	<u>Units</u>	<u>Date Analyzed</u>	<u>Analyst</u>
METALS IN SOIL OR SLUDGE BY ICP		SW6010A			KR
Arsenic	23.6	0.500	mg/Kg	12/3/2004	
Cadmium	2.42	0.250	mg/Kg	12/3/2004	
Chromium	27.2	0.250	mg/Kg	12/3/2004	
Lead	24.9	0.125	mg/Kg	12/3/2004	
Zinc	101	0.250	mg/Kg	12/3/2004	
SIEVE ANALYSIS		ASTM D422			JF
% Passed through #10 Sieve	13.70	0.10	wt%	12/2/2004	
% Retained by #10 Sieve	86.30	0.10	wt%	12/2/2004	
Sieve Analysis	100.00	0.010	wt%	12/2/2004	
PERCENT SOLIDS		E160.3			JF
Percent Solids	69.4	0.100	wt%	11/24/2004 2:00:0	

Lab ID: T04120072-06 Collection Date: 10/27/2004

Sample ID: #1 Retained by #10

Matrix: SOLID

<u>Analyses</u>	<u>Result</u>	<u>Detection Limit</u>	<u>Units</u>	<u>Date Analyzed</u>	<u>Analyst</u>
METALS IN SOIL OR SLUDGE BY ICP		SW6010A			KR
Arsenic	24.1	0.500	mg/Kg	12/3/2004	
Cadmium	3.01	0.250	mg/Kg	12/3/2004	
Chromium	23.4	0.250	mg/Kg	12/3/2004	
Lead	32.1	0.125	mg/Kg	12/3/2004	
Zinc	143	0.250	mg/Kg	12/3/2004	



CLIENT: A & M Engineering
 Lab Order: T04120072
 Project: Cherryvale

Date Received: 12/7/2004
 Date Reported: 08-Dec-04

Lab ID: T04120072-03 Collection Date: 10/27/2004

Sample ID: #4 Passed by #10

Matrix: SOLID

<u>Analyses</u>	<u>Result</u>	<u>Detection Limit</u>	<u>Units</u>	<u>Date Analyzed</u>	<u>Analyst</u>
METALS IN SOIL OR SLUDGE BY ICP	SW6010A				KR
Arsenic	38.7	0.500	mg/Kg	12/3/2004	
Cadmium	13.5	0.250	mg/Kg	12/3/2004	
Chromium	43.1	0.250	mg/Kg	12/3/2004	
Lead	69.5	0.125	mg/Kg	12/3/2004	
Zinc	934	2.50	mg/Kg	12/3/2004	
SIEVE ANALYSIS	ASTM D422				JF
% Passed through #10 Sieve	26.70	0.10	wt%	12/2/2004	
% Retained by #10 Sieve	73.30	0.10	wt%	12/2/2004	
Sieve Analysis	100.00	0.010	wt%	12/2/2004	
PERCENT SOLIDS	E160.3				JF
Percent Solids	75.3	0.100	wt%	11/24/2004 2:00:0	

Lab ID: T04120072-04 Collection Date: 10/27/2004

Sample ID: #4 Retained by #10

Matrix: SOLID

<u>Analyses</u>	<u>Result</u>	<u>Detection Limit</u>	<u>Units</u>	<u>Date Analyzed</u>	<u>Analyst</u>
METALS IN SOIL OR SLUDGE BY ICP	SW6010A				KR
Arsenic	31.3	0.500	mg/Kg	12/3/2004	
Cadmium	12.5	0.250	mg/Kg	12/3/2004	
Chromium	27.2	0.250	mg/Kg	12/3/2004	
Lead	52.2	0.125	mg/Kg	12/3/2004	
Zinc	776	2.50	mg/Kg	12/3/2004	

CLIENT: A & M Engineering
 Lab Order: T04120072
 Project: Cherryvale

Date Received: 12/7/2004
 Date Reported: 08-Dec-04

Lab ID: T04120072-07 Collection Date: 10/27/2004

Sample ID: #3 Passed by #10

Matrix: SOLID

<u>Analyses</u>	<u>Result</u>	<u>Detection Limit</u>	<u>Units</u>	<u>Date Analyzed</u>	<u>Analyst</u>
METALS IN SOIL OR SLUDGE BY ICP		SW6010A			KR
Arsenic	34.6	0.500	mg/Kg	11/30/2004	
Cadmium	5.80	0.250	mg/Kg	11/30/2004	
Chromium	35.4	0.250	mg/Kg	11/30/2004	
Lead	45.4	0.125	mg/Kg	11/30/2004	
Zinc	193	0.250	mg/Kg	11/30/2004	
SIEVE ANALYSIS		ASTM D422			JF
% Passed through #10 Sieve	30.40	0.10	wt%	12/2/2004	
% Retained by #10 Sieve	69.60	0.10	wt%	12/2/2004	
Sieve Analysis	100.00	0.010	wt%	12/2/2004	
PERCENT SOLIDS		E160.3			JF
Percent Solids	79.9	0.100	wt%	11/24/2004 2:00:0	

Lab ID: T04120072-08 Collection Date: 10/27/2004

Sample ID: #3 Retained by #10

Matrix: SOLID

<u>Analyses</u>	<u>Result</u>	<u>Detection Limit</u>	<u>Units</u>	<u>Date Analyzed</u>	<u>Analyst</u>
METALS IN SOIL OR SLUDGE BY ICP		SW6010A			KR
Arsenic	24.1	0.500	mg/Kg	12/3/2004	
Cadmium	6.11	0.250	mg/Kg	12/3/2004	
Chromium	26.3	0.250	mg/Kg	12/3/2004	
Lead	35.0	0.125	mg/Kg	12/3/2004	
Zinc	128	0.250	mg/Kg	12/3/2004	

CLIENT: A & M Engineering
 Lab Order: T04120072
 Project: Cherryvale

Date Received: 12/7/2004
 Date Reported: 08-Dec-04

Lab ID: T04120072-09 Collection Date: 10/27/2004

Sample ID: #5 Passed by #10

Matrix: SOLID

<u>Analyses</u>	<u>Result</u>	<u>Detection Limit</u>	<u>Units</u>	<u>Date Analyzed</u>	<u>Analyst</u>
METALS IN SOIL OR SLUDGE BY ICP					
					KR
Arsenic	66.0	0.500	mg/Kg	12/3/2004	
Cadmium	17.1	0.250	mg/Kg	12/3/2004	
Chromium	46.0	0.250	mg/Kg	12/3/2004	
Lead	94.5	0.125	mg/Kg	12/3/2004	
Zinc	1,350	2.50	mg/Kg	12/3/2004	
SIEVE ANALYSIS					
					JF
% Passed through #10 Sieve	25.40	0.10	wt%	12/2/2004	
% Retained by #10 Sieve	74.60	0.10	wt%	12/2/2004	
Sieve Analysis	100.00	0.010	wt%	12/2/2004	
PERCENT SOLIDS					
					JF
Percent Solids	78.8	0.100	wt%	11/24/2004 2:00:0	

Lab ID: T04120072-10 Collection Date: 10/27/2004

Sample ID: #5 Retained by #10

Matrix: SOLID

<u>Analyses</u>	<u>Result</u>	<u>Detection Limit</u>	<u>Units</u>	<u>Date Analyzed</u>	<u>Analyst</u>
METALS IN SOIL OR SLUDGE BY ICP					
					KR
Arsenic	42.0	0.500	mg/Kg	12/3/2004	
Cadmium	14.9	0.250	mg/Kg	12/3/2004	
Chromium	32.9	0.250	mg/Kg	12/3/2004	
Lead	142	0.125	mg/Kg	12/3/2004	
Zinc	961	2.50	mg/Kg	12/3/2004	



CLIENT: A & M Engineering
 Lab Order: T04120072
 Project: Cherryvale

Date Received: 12/7/2004
 Date Reported: 08-Dec-04

Lab ID: T04120072-11 Collection Date: 10/27/2004

Sample ID: #6 Passed by #10

Matrix: SOLID

<u>Analyses</u>	<u>Result</u>	<u>Detection Limit</u>	<u>Units</u>	<u>Date Analyzed</u>	<u>Analyst</u>
METALS IN SOIL OR SLUDGE BY ICP		SW6010A			KR
Arsenic	67.7	0.500	mg/Kg	12/3/2004	
Cadmium	9.93	0.250	mg/Kg	12/3/2004	
Chromium	33.8	0.250	mg/Kg	12/3/2004	
Lead	59.3	0.125	mg/Kg	12/3/2004	
Zinc	706	2.50	mg/Kg	12/3/2004	
SIEVE ANALYSIS		ASTM D422			JF
% Passed through #10 Sieve	20.40	0.10	wt%	12/2/2004	
% Retained by #10 Sieve	79.60	0.10	wt%	12/2/2004	
Sieve Analysis	100.00	0.010	wt%	12/2/2004	
PERCENT SOLIDS		E160.3			JF
Percent Solids	83.1	0.100	wt%	11/24/2004 2:00:0	

Lab ID: T04120072-12 Collection Date: 10/27/2004

Sample ID: #6 Retained by #10

Matrix: SOLID

<u>Analyses</u>	<u>Result</u>	<u>Detection Limit</u>	<u>Units</u>	<u>Date Analyzed</u>	<u>Analyst</u>
METALS IN SOIL OR SLUDGE BY ICP		SW6010A			KR
Arsenic	44.6	0.500	mg/Kg	12/3/2004	
Cadmium	11.8	0.250	mg/Kg	12/3/2004	
Chromium	24.3	0.250	mg/Kg	12/3/2004	
Lead	41.9	0.125	mg/Kg	12/3/2004	
Zinc	707	2.50	mg/Kg	12/3/2004	



CLIENT: A & M Engineering
 Lab Order: T04120072
 Project: Cherryvale

Date Received: 12/7/2004
 Date Reported: 08-Dec-04

Lab ID: T04120072-13 Collection Date: 10/27/2004

Sample ID: #7 Passed by #10

Matrix: SOLID

<u>Analyses</u>	<u>Result</u>	<u>Detection Limit</u>	<u>Units</u>	<u>Date Analyzed</u>	<u>Analyst</u>
METALS IN SOIL OR SLUDGE BY ICP SW6010A					
Arsenic	39.0	0.500	mg/Kg	12/3/2004	KR
Cadmium	13.8	0.250	mg/Kg	12/3/2004	
Chromium	31.4	0.250	mg/Kg	12/3/2004	
Lead	52.5	0.125	mg/Kg	12/3/2004	
Zinc	694	2.50	mg/Kg	12/3/2004	
SIEVE ANALYSIS ASTM D422					
% Passed through #10 Sieve	12.00	0.10	wt%	12/2/2004	JF
% Retained by #10 Sieve	88.00	0.10	wt%	12/2/2004	
Sieve Analysis	100.00	0.010	wt%	12/2/2004	
PERCENT SOLIDS E160.3					
Percent Solids	84.7	0.100	wt%	11/24/2004 2:00:0	JF

Lab ID: T04120072-14 Collection Date: 10/27/2004

Sample ID: #7 Retained by #10

Matrix: SOLID

<u>Analyses</u>	<u>Result</u>	<u>Detection Limit</u>	<u>Units</u>	<u>Date Analyzed</u>	<u>Analyst</u>
METALS IN SOIL OR SLUDGE BY ICP SW6010A					
Arsenic	22.7	0.500	mg/Kg	12/3/2004	KR
Cadmium	12.1	0.250	mg/Kg	12/3/2004	
Chromium	24.4	0.250	mg/Kg	12/3/2004	
Lead	38.7	0.125	mg/Kg	12/3/2004	
Zinc	638	2.50	mg/Kg	12/3/2004	



CLIENT: A & M Engineering
Work Order: T04120072
Project: Cherryvale

QC SUMMARY REPORT

TestCode	Analyte	BatchID	QCType	Result	PQL	Units	%Rec	%RPD
MET_S_ICP	Arsenic	R20977	MBLK	< 0.50	0.5	mg/Kg		
	Cadmium	R20977	MBLK	< 0.25	0.25	mg/Kg		
	Chromium	R20977	MBLK	< 0.25	0.25	mg/Kg		
	Lead	R20977	MBLK	< 0.12	0.125	mg/Kg		
	Zinc	R20977	MBLK	< 0.25	0.25	mg/Kg		
	Arsenic	R20977	LCS	48.78	0.5	mg/Kg	97.6	
	Cadmium	R20977	LCS	48.73	0.25	mg/Kg	97.5	
	Chromium	R20977	LCS	49.66	0.25	mg/Kg	99.3	
	Lead	R20977	LCS	48.96	0.125	mg/Kg	97.9	
	Zinc	R20977	LCS	49.54	0.25	mg/Kg	99.1	
	Arsenic	R20977	MS	58.67	0.5	mg/Kg	45.9	
	Cadmium	R20977	MS	54.16	0.25	mg/Kg	78	
	Chromium	R20977	MS	86.32	0.25	mg/Kg	96.7	
	Lead	R20977	MS	129	0.125	mg/Kg	68.1	
	Zinc	R20977	MS	1067	0.25	mg/Kg	-308	
	Arsenic	R20977	MSD	63.74	0.5	mg/Kg	56.1	8.28
	Cadmium	R20977	MSD	53.56	0.25	mg/Kg	76.8	1.13
	Chromium	R20977	MSD	75.91	0.25	mg/Kg	75.9	12.8
	Lead	R20977	MSD	122	0.125	mg/Kg	54.1	5.58
	Zinc	R20977	MSD	1088	0.25	mg/Kg	-266	1.95
SOLIDS	Percent Solids	R20979	DUP	78.44	0.1	wt%	0	4.06

CLIENT: A & M Engineering
Lab Order: T04100305
Project: Cherryvale Drum Creek

Date Received: 10/28/2004
Date Reported: 08-Dec-04

Lab ID: T04100305-01 Collection Date: 10/27/2004 12:15:00 P Sample ID: #8

Matrix: SOLID

<u>Analyses</u>	<u>Result</u>	<u>Detection Limit</u>	<u>Units</u>	<u>Date Analyzed</u>	<u>Analyst</u>
METALS IN SOIL OR SLUDGE BY ICP	SW6010A				KR
Arsenic	25.4	0.575	mg/Kg-dry	10/29/2004	
Cadmium	10.8	0.288	mg/Kg-dry	10/29/2004	
Chromium	18.2	0.288	mg/Kg-dry	10/29/2004	
Lead	37.8	0.144	mg/Kg-dry	10/29/2004	
Zinc	544	2.88	mg/Kg-dry	10/29/2004	

Lab ID: T04100305-02 Collection Date: 10/27/2004 11:30:00 A Sample ID: #4

Matrix: SOLID

<u>Analyses</u>	<u>Result</u>	<u>Detection Limit</u>	<u>Units</u>	<u>Date Analyzed</u>	<u>Analyst</u>
METALS IN SOIL OR SLUDGE BY ICP	SW6010A				KR
Arsenic	40.8	0.664	mg/Kg-dry	10/29/2004	
Cadmium	17.0	0.332	mg/Kg-dry	10/29/2004	
Chromium	34.1	0.332	mg/Kg-dry	10/29/2004	
Lead	69.4	0.166	mg/Kg-dry	10/29/2004	
Zinc	644	3.32	mg/Kg-dry	10/29/2004	

Lab ID: T04100305-03 Collection Date: 10/27/2004 1:55:00 P Sample ID: #1

Matrix: SOLID

<u>Analyses</u>	<u>Result</u>	<u>Detection Limit</u>	<u>Units</u>	<u>Date Analyzed</u>	<u>Analyst</u>
METALS IN SOIL OR SLUDGE BY ICP	SW6010A				KR
Arsenic	34.2	0.721	mg/Kg-dry	10/29/2004	
Cadmium	6.60	0.360	mg/Kg-dry	10/29/2004	
Chromium	33.8	0.360	mg/Kg-dry	10/29/2004	
Lead	36.4	0.180	mg/Kg-dry	10/29/2004	
Zinc	112	0.360	mg/Kg-dry	10/29/2004	



CLIENT: A & M Engineering
 Lab Order: T04100305
 Project: Cherryvale Drum Creek

Date Received: 10/28/2004
 Date Reported: 08-Dec-04

Lab ID: T04100305-04 Collection Date: 10/27/2004 2:35:00 P Sample ID: #3

Matrix: SOLID

<u>Analyses</u>	<u>Result</u>	<u>Detection Limit</u>	<u>Units</u>	<u>Date Analyzed</u>	<u>Analyst</u>
METALS IN SOIL OR SLUDGE BY ICP		SW6010A			KR
Arsenic	56.5	0.626	mg/Kg-dry	10/29/2004	
Cadmium	13.9	0.313	mg/Kg-dry	10/29/2004	
Chromium	39.3	0.313	mg/Kg-dry	10/29/2004	
Lead	69.5	0.156	mg/Kg-dry	10/29/2004	
Zinc	374	3.13	mg/Kg-dry	10/29/2004	

Lab ID: T04100305-05 Collection Date: 10/27/2004 5:00:00 P Sample ID: #5

Matrix: SOLID

<u>Analyses</u>	<u>Result</u>	<u>Detection Limit</u>	<u>Units</u>	<u>Date Analyzed</u>	<u>Analyst</u>
METALS IN SOIL OR SLUDGE BY ICP		SW6010A			KR
Arsenic	38.7	0.634	mg/Kg-dry	10/29/2004	
Cadmium	21.0	0.317	mg/Kg-dry	10/29/2004	
Chromium	36.4	0.317	mg/Kg-dry	10/29/2004	
Lead	64.2	0.159	mg/Kg-dry	10/29/2004	
Zinc	1,080	3.17	mg/Kg-dry	10/29/2004	

Lab ID: T04100305-06 Collection Date: 10/27/2004 4:00:00 P Sample ID: #6

Matrix: SOLID

<u>Analyses</u>	<u>Result</u>	<u>Detection Limit</u>	<u>Units</u>	<u>Date Analyzed</u>	<u>Analyst</u>
METALS IN SOIL OR SLUDGE BY ICP		SW6010A			KR
Arsenic	45.2	0.602	mg/Kg-dry	10/29/2004	
Cadmium	18.4	0.301	mg/Kg-dry	10/29/2004	
Chromium	43.8	0.301	mg/Kg-dry	10/29/2004	
Lead	91.2	0.150	mg/Kg-dry	10/29/2004	
Zinc	1,010	3.01	mg/Kg-dry	10/29/2004	



CLIENT: A & M Engineering
Lab Order: T04100305
Project: Cherryvale Drum Creek

Date Received: 10/28/2004
Date Reported: 08-Dec-04

Lab ID: T04100305-07 Collection Date: 10/27/2004 4:35:00 P Sample ID: #7

Matrix: SOLID

<u>Analyses</u>	<u>Result</u>	<u>Detection Limit</u>	<u>Units</u>	<u>Date Analyzed</u>	<u>Analyst</u>
METALS IN SOIL OR SLUDGE BY ICP		SW6010A			KR
Arsenic	65.3	0.591	mg/Kg-dry	10/29/2004	
Cadmium	26.8	0.295	mg/Kg-dry	10/29/2004	
Chromium	29.1	0.295	mg/Kg-dry	10/29/2004	
Lead	66.3	0.148	mg/Kg-dry	10/29/2004	
Zinc	1,340	2.95	mg/Kg-dry	10/29/2004	



311 North Aspen
Broken Arrow, OK 74012
(918) 251-2515
FAX (918) 251-0008

December 7, 2004

Irfan Taner
A & M Engineering
10010 E. 16th Street
Tulsa, OK 74128

PROJECT:
OUTREACH LAB ID: 20040860

Dear Mr. Taner:

Please find enclosed the analytical report for your samples received in our laboratory on December 01, 2004 for the above captioned project. Two soil samples that had been dried and passed through a 10 mesh sieve were digested prior to analysis for metals by ICP. Results were faxed in 4 work-days. The final hardcopy is attached.

The method blank, laboratory control standard and matrix spikes and spike duplicates for all analyses were within method control limits.

Unless we are notified otherwise, all non-radioactive, non-hazardous samples will be disposed after 30 days from the report date. All others will be returned to you.

Thank you for choosing Outreach Laboratory and if you have any questions feel free to call.

Laboratory Director

A handwritten signature in black ink, written over a horizontal line. The signature is stylized and appears to be the initials "IT" followed by a surname.

ODEQ ID #9517
Cert# OK0001
NRC ODEQ LIC. #27522-01





Outreach Laboratory

311 North Aspen
Broken Arrow, OK 74012
(918) 251-2515
FAX (918) 251-0008

Client: A & M Engineering & Environmental Serv.
Client Project:
Lab Number: 20040860
Date Reported: 12/7/2004
Date Received: 12/1/04
Page Number: 1 of 2

Analytical Report

Method	Result	Units	DL	Prep Date	Analysis Date	Analyst
Lab ID: 20040860-01						
Client ID: 305-04 #3						
Date Sampled:						
Matrix: Soil						
Metals Analyses						
Arsenic	EPA 6010B/200.7	55.0 mg/kg	0.499	12/3/2004	12/3/2004	RE
Cadmium	EPA 6010B/200.7	13.6 mg/kg	0.499	12/3/2004	12/3/2004	RE
Chromium	EPA 6010B/200.7	3.00 mg/kg	0.499	12/3/2004	12/3/2004	RE
Lead	EPA 6010B/200.7	72.8 mg/kg	0.999	12/3/2004	12/3/2004	RE
Zinc	EPA 6010B/200.7	320 mg/kg	1.40	12/3/2004	12/3/2004	RE
Lab ID: 20040860-02						
Client ID: 305-01 #8						
Date Sampled:						
Matrix: Soil						
Metals Analyses						
Arsenic	EPA 6010B/200.7	57.1 mg/kg	0.496	12/3/2004	12/3/2004	RE
Cadmium	EPA 6010B/200.7	21.5 mg/kg	0.496	12/3/2004	12/3/2004	RE
Chromium	EPA 6010B/200.7	BDL mg/kg	0.496	12/3/2004	12/3/2004	RE
Lead	EPA 6010B/200.7	86.4 mg/kg	0.992	12/3/2004	12/3/2004	RE
Zinc	EPA 6010B/200.7	1010 mg/kg	1.39	12/3/2004	12/3/2004	RE

BDL = Below Detection Limit



Outreach Laboratory

311 North Aspen
Broken Arrow, OK 74012
(918) 251-2515
FAX (918) 251-0008

Client: A & M Engineering & Environmental Serv.
Client Project:
Lab Number: 20040860
Date Reported: 12/7/2004
Date Received: 12/1/04
Page Number: 2 of 2

QC Report

Parameter	Blank	LCS %REC	LCSD		DUP RPD	MS %REC	MSD		Date
			%REC	RPD			%REC	RPD	
Arsenic	0.500	92.0				96.0	94.0	2.4	12/3/2004
Cadmium	BDL	93.0				84.0	84.0	0.4	12/3/2004
Chromium	0.700	83.0				86.0	93.0	8.3	12/3/2004
Lead	1.00	93.0				92.0	83.0	10.0	12/3/2004
Zinc	18.5	96.0				54.0	68.0	22.2	12/3/2004

Lab Approval: _____



Chain of Custody Record

Laboratory Number: **20040860**

Company Name: A+M ENG	Billing Information:	PO Number:	Project Name/Number:	Page 1 of 1
Contact Name:		Quote Number:	Sampler's Signature	Turn Time <input type="checkbox"/> Standard <input type="checkbox"/> 1 Day <input type="checkbox"/> 2 Day <input type="checkbox"/> Other
Address:		Required QC Level		(Rush turn times will incur a surcharge and must be pre-approved by lab.)
City, State, Zip:		Bill Monthly <input type="checkbox"/> Yes <input type="checkbox"/> No	Shipping Method: UPS / FedEx / Airborne DHL / GCT / Hand / Mail	
Phone Number: Ext:				
Fax Number:				
Email Address:				

Which Regulations Apply:		Matrix Code:		Container		Pres.	Requested Tests				Comments	
<input type="checkbox"/> RCRA	<input type="checkbox"/> Drinking Water	AQ = Aqueous	SO = Soil	Quantity	Type	HCl, HNO ₃ , H ₂ SO ₄ , NaOH, Na ₂ S ₂ O ₈						
<input type="checkbox"/> POTW	<input type="checkbox"/> Distribution	DW = Drinking	O = Oil		P=Plastic							
<input type="checkbox"/> NPDES	<input type="checkbox"/> Special	WW = Waste	SL = Sludge		G=Glass, V=Vial							
<input type="checkbox"/> USDA/FDA	<input type="checkbox"/> State	MW = Monit. Well	F = Food									
<input type="checkbox"/> RECAP/RISC	<input type="checkbox"/> Other	LQ = Liquid	SW = Swab									
			SOL = Solid									
Sample ID/Description	Date	Time	Grab / Composite	Matrix								
305-04 = # 3			C	Soil	1	-	-	As, Cd, Pb	Cu, Zn	Pb, Tl	12/1/04	
305-01 = # 8			C	Soil	1	-	-					

Returned to Customer after dried and sieved through #10 mesh. Note: Do not crush prior to digest.

	Relinquished by	Date/Time	Received by	Date/Time	Field Notes
1	Chadwick Lawrence	11/01/04 10:18	Tony [Signature]		
2	T. [Signature]	12/01/04 10:40	[Signature]	12/10/04 10:40	
3					Received on ice? <input type="checkbox"/> Yes <input type="checkbox"/> No
4					Temp:

All samples submitted to Green Country Testing for analysis are accepted on a custodial basis only. Ownership of the material remains with the client submitting the samples. Green Country Testing reserves the right to return unused sample portions.
 Green Country Testing
 6825 East 38th Street • Tulsa, OK 74145
 918-828-9977 • Fax (918) 828-7756



**Outreach
Laboratory**

311 North Aspen
Broken Arrow, OK 74012
(918) 251-2515
FAX (918) 251-0008

December 16, 2004

Tony Mummalo
A & M Engineering
10010 E. 16th Street
Tulsa, OK 74128

PROJECT:
OUTREACH LAB ID: 20040860

Dear Mr. Mummalo:

Please find enclosed an amended analytical report for the above captioned project. At your request, the samples were reran and mapped to verify the Chromium results. An interfering peak was identified and used to correct the results. Only the Chromium results have changed.

If you have any questions, please call us at 251-2515.

Laboratory Director



Cert# OK0001

ODEQ ID #9517
NRC ODEQ LIC. #27522-01



Outreach Laboratory

311 North Aspen
Broken Arrow, OK 74012
(918) 251-2515
FAX (918) 251-0008

AMENDED

Client: A & M Engineering & Environmental Serv.
Client Project:
Lab Number: 20040860
Date Reported: 12/16/2004
Date Received: 12/1/04
Page Number: 1 of 2

Analytical Report

Method	Result	Units	DL	Prep Date	Analysis Date	Analyst
Lab ID: 20040860-01						
Client ID: 305-04 #3						
Date Sampled:						
Matrix: Soil						
Metals Analyses						
Arsenic	EPA 6010B/200.7	55.0 mg/kg	0.499	12/3/2004	12/3/2004	RE
Cadmium	EPA 6010B/200.7	13.6 mg/kg	0.499	12/3/2004	12/3/2004	RE
Chromium	EPA 6010B/200.7	35.4 mg/kg	0.499	12/3/2004	12/16/2004	RE
Lead	EPA 6010B/200.7	72.8 mg/kg	0.999	12/3/2004	12/3/2004	RE
Zinc	EPA 6010B/200.7	320 mg/kg	1.40	12/3/2004	12/3/2004	RE
Lab ID: 20040860-02						
Client ID: 305-01 #8						
Date Sampled:						
Matrix: Soil						
Metals Analyses						
Arsenic	EPA 6010B/200.7	57.1 mg/kg	0.496	12/3/2004	12/3/2004	RE
Cadmium	EPA 6010B/200.7	21.5 mg/kg	0.496	12/3/2004	12/3/2004	RE
Chromium	EPA 6010B/200.7	31.2 mg/kg	0.496	12/3/2004	12/16/2004	RE
Lead	EPA 6010B/200.7	86.4 mg/kg	0.992	12/3/2004	12/3/2004	RE
Zinc	EPA 6010B/200.7	1010 mg/kg	1.39	12/3/2004	12/3/2004	RE

BDL = Below Detection Limit



Outreach Laboratory

311 North Aspen
Broken Arrow, OK 74012
(918) 251-2515
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Client: A & M Engineering & Environmental Serv.
Client Project:
Lab Number: 20040860
Date Reported: 12/16/2004
Date Received: 12/1/04
Page Number: 2 of 2

QC Report

Parameter	Blank	LCS %REC	LCSD		DUP RPD	MS %REC	MSD		Date
			%REC	RPD			%REC	RPD	
Arsenic	0.500	92.0				96.0	94.0	2.4	12/3/2004
Cadmium	BDL	93.0				84.0	84.0	0.4	12/3/2004
Chromium	0.800	82.0				89.0	101.0	12.7	12/16/2004
Lead	1.00	93.0				92.0	83.0	10.0	12/3/2004
Zinc	18.5	96.0				54.0	68.0	22.2	12/3/2004

Lab Approval: _____



DIVISION OF HEALTH & ENVIRONMENTAL LABORATORIES

Kansas Department of Health and Environment
Forbes Field, Bldg. 740, Topeka, Kansas 66620-0001



REPORT OF ANALYSIS

INORGANIC CHEMISTRY

Report To: Bureau of Env. Remediation
Curtis SOB, Suite 410
ATTN: ROB BIXBY
Topeka KS 66612

Analysis Code: PT Lab Number: 443483

Site ID: 4EM80
Account Code: EB

Collection Location: NATIONAL ZINC LOW WATER CROSSING #4

Collector: ROB BIXBY

Matrix: Sediment/Sludge Collect Depth:

Date/Time Collected: 10/27/04 11:25

Date/Time Received: 10/28/04 10:06

Sample Comments:

Parameter	Analytical Result	Units	Analysis Date	Analytical Method
Aluminum (Total)	17000	mg/Kg	11/15/04	EPA 6010
Antimony (Total)	< 5.0	mg/Kg	11/15/04	EPA 6010
Arsenic (Total)	84	mg/Kg	11/15/04	EPA 6010
Barium (Total)	250	mg/Kg	11/15/04	EPA 6010
Beryllium (Total)	2.7	mg/Kg	11/15/04	EPA 6010
Boron (Total)	< 5.0	mg/Kg	11/15/04	EPA 6010
Cadmium (Total)	28	mg/Kg	11/15/04	EPA 6010
Calcium (Total)	29000	mg/Kg	11/15/04	EPA 6010
Chromium (Total)	46	mg/Kg	11/15/04	EPA 6010
Cobalt (Total)	49	mg/Kg	11/15/04	EPA 6010
Copper (Total)	180	mg/Kg	11/15/04	EPA 6010
Iron (Total)	190000	mg/Kg	11/15/04	EPA 6010
Lead (Total)	87	mg/Kg	11/15/04	EPA 6010
Magnesium (Total)	2500	mg/Kg	11/15/04	EPA 6010
Manganese (Total)	4100	mg/Kg	11/15/04	EPA 6010
Molybdenum (Total)	4.3	mg/Kg	11/15/04	EPA 6010
Nickel (Total)	94	mg/Kg	11/15/04	EPA 6010
Percent Solids	75	Percent	11/01/04	EPA 1311
Potassium (Total)	2300	mg/Kg	11/15/04	EPA 6010
Selenium (Total)	8.4	mg/Kg	11/15/04	EPA 6010
Silica (Total)	2000	mg/Kg	11/15/04	EPA 6010
Silver (Total)	< 1.0	mg/Kg	11/15/04	EPA 6010
Sodium (Total)	140	mg/Kg	11/15/04	EPA 6010
Thallium (Total)	< 5.0	mg/Kg	11/15/04	EPA 6010
Vanadium (Total)	120	mg/Kg	11/15/04	EPA 6010
Zinc (Total)	2500	mg/Kg	11/15/04	EPA 6010

Analytical Comments:

Results for total metals are expressed on a dry weight basis.

Reporting Analyst: JAB
Date Reported: 11/19/04
Copies To: File

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BUREAU OF ENVIRONMENTAL REMEDIATION



DIVISION OF HEALTH & ENVIRONMENTAL LABORATORIES

Kansas Department of Health and Environment
Forbes Field, Bldg. 740, Topeka, Kansas 66620-0001



REPORT OF ANALYSIS

INORGANIC CHEMISTRY

Report To: Bureau of Env. Remediation
Curtis SOB, Suite 410
ATTN; ROB BIXBY
Topeka KS 66612

Analysis Code: PT Lab Number: 443484

Site ID: 4EM80
Account Code: EB

Collection Location: NATIONAL ZINC FAR SOUTH #8

Collector: ROB BIXBY

Matrix: Sediment/Sludge Collect Depth:

Date/Time Collected: 10/27/04 12:10

Date/Time Received: 10/28/04 10:06

Sample Comments:

Parameter	Analytical Result	Units	Analysis Date	Analytical Method
Aluminum (Total)	16000	mg/Kg	11/15/04	EPA 6010
Antimony (Total)	< 5.0	mg/Kg	11/15/04	EPA 6010
Arsenic (Total)	35	mg/Kg	11/15/04	EPA 6010
Barium (Total)	330	mg/Kg	11/15/04	EPA 6010
Beryllium (Total)	3.1	mg/Kg	11/15/04	EPA 6010
Boron (Total)	< 5.0	mg/Kg	11/15/04	EPA 6010
Cadmium (Total)	17	mg/Kg	11/15/04	EPA 6010
Calcium (Total)	19000	mg/Kg	11/15/04	EPA 6010
Chromium (Total)	52	mg/Kg	11/15/04	EPA 6010
Cobalt (Total)	57	mg/Kg	11/15/04	EPA 6010
Copper (Total)	91	mg/Kg	11/15/04	EPA 6010
Iron (Total)	240000	mg/Kg	11/15/04	EPA 6010
Lead (Total)	79	mg/Kg	11/15/04	EPA 6010
Magnesium (Total)	2700	mg/Kg	11/15/04	EPA 6010
Manganese (Total)	6000	mg/Kg	11/15/04	EPA 6010
Molybdenum (Total)	4.2	mg/Kg	11/15/04	EPA 6010
Nickel (Total)	110	mg/Kg	11/15/04	EPA 6010
Percent Solids	84	Percent	11/01/04	EPA 1311
Potassium (Total)	2400	mg/Kg	11/15/04	EPA 6010
Selenium (Total)	8.8	mg/Kg	11/15/04	EPA 6010
Silica (Total)	2000	mg/Kg	11/15/04	EPA 6010
Silver (Total)	< 1.0	mg/Kg	11/15/04	EPA 6010
Sodium (Total)	150	mg/Kg	11/15/04	EPA 6010
Thallium (Total)	< 5.0	mg/Kg	11/15/04	EPA 6010
Vanadium (Total)	130	mg/Kg	11/15/04	EPA 6010
Zinc (Total)	1200	mg/Kg	11/15/04	EPA 6010

Analytical Comments:

Results for total metals are expressed on a dry weight basis.

Reporting Analyst: JAB
Date Reported: 11/19/04
Copies To: File

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BUREAU OF ENVIRONMENTAL REMEDIATION

Duane R. Boline, Ph.D., Director
Laboratory Customer Service - (785) 296-1620
Laboratory Fax - (785) 296-1641
CI 14 No. 1700648254



DIVISION OF HEALTH & ENVIRONMENTAL LABORATORIES
 Kansas Department of Health and Environment
 Forbes Field, Bldg. 740, Topeka, Kansas 66620-0001



REPORT OF ANALYSIS

INORGANIC CHEMISTRY

Report To: Bureau of Env. Remediation
 Curtis SOB, Suite 410
 ATTN: Rob Bixby
 Topeka KS 66612

Analysis Code: PT Lab Number: 444464
 Site ID: 4EM80
 Account Code: EB

Collection Location: National Zinc - #3
 Collector: A & M Engineering
 Date/Time Collected: 10/27/04 14:35

Matrix: Sediment/Sludge Collect Depth:
 Date/Time Received: 11/30/04 12:58

Sample Comments:

Parameter	Analytical Result	Units	Analysis Date	Analytical Method
Arsenic (Total)	100	mg/Kg	12/06/04	EPA 6010
Cadmium (Total)	5.4	mg/Kg	12/06/04	EPA 6010
Chromium (Total)	55	mg/Kg	12/06/04	EPA 6010
Lead (Total)	55	mg/Kg	12/06/04	EPA 6010
Percent Solids	81	Percent	12/02/04	EPA 1311
Zinc (Total)	290	mg/Kg	12/06/04	EPA 6010

Analytical Comments:

Results for total metals are expressed on a dry weight basis.

Reporting Analyst: JAB
 Date Reported: 12/08/04
 Copies To: File

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BUREAU OF ENVIRONMENTAL REMEDIATION

Duane R. Boline, Ph.D., Director
 Laboratory Customer Service - (785) 296-1620
 Laboratory Fax - (785) 296-1641
 CLIA No. 17D0648254



Altay Ertugrul
A & M Engineering
10010 E. 16th St.
Tulsa, OK 74128-4813
TEL: (918) 665-6574
FAX () 665-6576

November 02, 2004
Order No.: T04100304

RE: Cherryvale Drum Creek

Dear Altay Ertugrul:

Green Country Testing, Inc. received 9 samples on 10/28/2004 for the analyses presented in the following report.

In accordance with your instructions, Green Country Testing conducted the analysis shown on the following pages on samples submitted by your company. The results related only to the items tested. Unless otherwise noted, all analysis was conducted using EPA approved methodologies. Test reports meet all the NELAC requirements. All relevant sampling information is on the attached chain-of-custody form. The initials SUB as the analyst designate any testing sub-contracted by Green Country Testing.

Certifications/Accreditation: OK - 7604
AR - ADEQ
KS - E-10232
LA - 4002

A scope of Certified/Accredited parameters is available upon request. If you have any questions regarding these tests results, please feel free to call.

Sincerely,

Approved By: 
Brian Duzan, Director
Environmental Services

CLIENT: A & M Engineering
Lab Order: T04100304
Project: Cherryvale Drum Creek

Date Received: 10/28/2004
Date Reported: 02-Nov-04

Lab ID: T04100304-01 Collection Date: 10/27/2004 12:15:00 P Sample ID: #8 Far South

Matrix: AQUEOUS

<u>Analyses</u>	<u>Result</u>	<u>Detection Limit</u>	<u>Units</u>	<u>Date Analyzed</u>	<u>Analyst</u>
HARDNESS	E130.2				JF
Hardness (As CaCO ₃)	140	2.0	mg/L	10/29/2004 10:00	
METALS IN WATER BY ICP, TOTAL	E200.7				KR
Arsenic	< 0.00500	0.00500	mg/L	11/1/2004 11:54:5	
Cadmium	< 0.00100	0.00100	mg/L	11/1/2004 11:54:5	
Chromium	< 0.0100	0.0100	mg/L	11/1/2004 11:54:5	
Lead	< 0.00500	0.00500	mg/L	11/1/2004 11:54:5	
Zinc	< 0.0100	0.0100	mg/L	11/1/2004 11:54:5	

Lab ID: T04100304-02 Collection Date: 10/27/2004 11:40:00 A Sample ID: #4 Low Water Cres.

Matrix: AQUEOUS

<u>Analyses</u>	<u>Result</u>	<u>Detection Limit</u>	<u>Units</u>	<u>Date Analyzed</u>	<u>Analyst</u>
HARDNESS	E130.2				JF
Hardness (As CaCO ₃)	120	2.0	mg/L	10/29/2004 10:00	
METALS IN WATER BY ICP, TOTAL	E200.7				KR
Arsenic	< 0.00500	0.00500	mg/L	11/1/2004 12:19:0	
Cadmium	< 0.00100	0.00100	mg/L	11/1/2004 12:19:0	
Chromium	< 0.0100	0.0100	mg/L	11/1/2004 12:19:0	
Lead	< 0.00500	0.00500	mg/L	11/1/2004 12:19:0	
Zinc	< 0.0100	0.0100	mg/L	11/1/2004 12:19:0	

Lab ID: T04100304-03 Collection Date: 10/27/2004 2:00:00 P Sample ID: #1

Matrix: AQUEOUS

<u>Analyses</u>	<u>Result</u>	<u>Detection Limit</u>	<u>Units</u>	<u>Date Analyzed</u>	<u>Analyst</u>
HARDNESS	E130.2				JF
Hardness (As CaCO ₃)	82	2.0	mg/L	10/29/2004 10:00	
METALS IN WATER BY ICP, TOTAL	E200.7				KR
Arsenic	< 0.00500	0.00500	mg/L	11/1/2004 12:23:5	
Cadmium	< 0.00100	0.00100	mg/L	11/1/2004 12:23:5	
Chromium	< 0.0100	0.0100	mg/L	11/1/2004 12:23:5	
Lead	< 0.00500	0.00500	mg/L	11/1/2004 12:23:5	
Zinc	< 0.0100	0.0100	mg/L	11/1/2004 12:23:5	



CLIENT: A & M Engineering
 Lab Order: T04100304
 Project: Cherryvale Drum Creek

Date Received: 10/28/2004
 Date Reported: 02-Nov-04

Lab ID: T04100304-04 Collection Date: 10/27/2004 2:35:00 P Sample ID: #3

Matrix: AQUEOUS

<u>Analyses</u>	<u>Result</u>	<u>Detection Limit</u>	<u>Units</u>	<u>Date Analyzed</u>	<u>Analyst</u>
HARDNESS	E130.2				JF
Hardness (As CaCO ₃)	86	2.0	mg/L	10/29/2004 10:00:	
METALS IN WATER BY ICP, TOTAL	E200.7				KR
Arsenic	< 0.00500	0.00500	mg/L	11/1/2004 12:28:3	
Cadmium	< 0.00100	0.00100	mg/L	11/1/2004 12:28:3	
Chromium	< 0.0100	0.0100	mg/L	11/1/2004 12:28:3	
Lead	< 0.00500	0.00500	mg/L	11/1/2004 12:28:3	
Zinc	< 0.0100	0.0100	mg/L	11/1/2004 12:28:3	

Lab ID: T04100304-05 Collection Date: 10/27/2004 2:50:00 P Sample ID: #2 City Outfall

Matrix: AQUEOUS

<u>Analyses</u>	<u>Result</u>	<u>Detection Limit</u>	<u>Units</u>	<u>Date Analyzed</u>	<u>Analyst</u>
HARDNESS	E130.2				JF
Hardness (As CaCO ₃)	160	2.0	mg/L	10/29/2004 10:00:	
METALS IN WATER BY ICP, TOTAL	E200.7				KR
Arsenic	< 0.00500	0.00500	mg/L	11/1/2004 12:33:3	
Cadmium	< 0.00100	0.00100	mg/L	11/1/2004 12:33:3	
Chromium	< 0.0100	0.0100	mg/L	11/1/2004 12:33:3	
Lead	< 0.00500	0.00500	mg/L	11/1/2004 12:33:3	
Zinc	< 0.0100	0.0100	mg/L	11/1/2004 12:33:3	
TOTAL SUSPENDED SOLIDS	E160.2				PB
Suspended Solids (Residue, Non-Filterable)	23.0	5.00	mg/L	10/29/2004 11:35:	

CLIENT: A & M Engineering
 Lab Order: T04100304
 Project: Cherryvale Drum Creek

Date Received: 10/28/2004
 Date Reported: 02-Nov-04

Lab ID: T04100304-06 Collection Date: 10/27/2004 5:00:00 P Sample ID: #5

Matrix: AQUEOUS

<u>Analyses</u>	<u>Result</u>	<u>Detection Limit</u>	<u>Units</u>	<u>Date Analyzed</u>	<u>Analyst</u>
HARDNESS	E130.2				JF
Hardness (As CaCO3)	120	2.0	mg/L	10/29/2004 10:00:	
METALS IN WATER BY ICP, TOTAL	E200.7				KR
Arsenic	< 0.00500	0.00500	mg/L	11/1/2004 12:38:2	
Cadmium	< 0.00100	0.00100	mg/L	11/1/2004 12:38:2	
Chromium	< 0.0100	0.0100	mg/L	11/1/2004 12:38:2	
Lead	< 0.00500	0.00500	mg/L	11/1/2004 12:38:2	
Zinc	< 0.0100	0.0100	mg/L	11/1/2004 12:38:2	

Lab ID: T04100304-07 Collection Date: 10/27/2004 4:15:00 P Sample ID: #6

Matrix: AQUEOUS

<u>Analyses</u>	<u>Result</u>	<u>Detection Limit</u>	<u>Units</u>	<u>Date Analyzed</u>	<u>Analyst</u>
HARDNESS	E130.2				JF
Hardness (As CaCO3)	120	2.0	mg/L	10/29/2004 10:00:	
METALS IN WATER BY ICP, TOTAL	E200.7				KR
Arsenic	< 0.00500	0.00500	mg/L	11/1/2004 12:43:1	
Cadmium	< 0.00100	0.00100	mg/L	11/1/2004 12:43:1	
Chromium	< 0.0100	0.0100	mg/L	11/1/2004 12:43:1	
Lead	< 0.00500	0.00500	mg/L	11/1/2004 12:43:1	
Zinc	< 0.0100	0.0100	mg/L	11/1/2004 12:43:1	

Lab ID: T04100304-08 Collection Date: 10/27/2004 4:35:00 P Sample ID: #7

Matrix: AQUEOUS

<u>Analyses</u>	<u>Result</u>	<u>Detection Limit</u>	<u>Units</u>	<u>Date Analyzed</u>	<u>Analyst</u>
HARDNESS	E130.2				JF
Hardness (As CaCO3)	120	2.0	mg/L	10/29/2004 10:00:	
METALS IN WATER BY ICP, TOTAL	E200.7				KR
Arsenic	< 0.00500	0.00500	mg/L	11/1/2004 12:48:0	
Cadmium	< 0.00100	0.00100	mg/L	11/1/2004 12:48:0	
Chromium	< 0.0100	0.0100	mg/L	11/1/2004 12:48:0	
Lead	< 0.00500	0.00500	mg/L	11/1/2004 12:48:0	
Zinc	< 0.0100	0.0100	mg/L	11/1/2004 12:48:0	



CLIENT: A & M Engineering
Lab Order: T04100304
Project: Cherryvale Drum Creek

Date Received: 10/28/2004
Date Reported: 02-Nov-04

Lab ID: T04100304-09 Collection Date: 10/27/2004

Sample ID: Eq. Blank

Matrix: AQUEOUS

<u>Analyses</u>	<u>Result</u>	<u>Detection Limit</u>	<u>Units</u>	<u>Date Analyzed</u>	<u>Analyst</u>
METALS IN WATER BY ICP, TOTAL	E200.7				KR
Arsenic	< 0.00500	0.00500	mg/L	11/1/2004 12:52:5	
Cadmium	< 0.00100	0.00100	mg/L	11/1/2004 12:52:5	
Chromium	< 0.0100	0.0100	mg/L	11/1/2004 12:52:5	
Lead	< 0.00500	0.00500	mg/L	11/1/2004 12:52:5	
Zinc	< 0.0100	0.0100	mg/L	11/1/2004 12:52:5	



CLIENT: A & M Engineering
 Work Order: T04100304
 Project: Cherryvale Drum Creek

QC SUMMARY REPORT

TestCode	Analyte	BatchID	QCType	Result	PQL	Units	%Rec	%RPD
HARD	Hardness (As CaCO3)	R20601	LCS	100	2	mg/L	100	
	Hardness (As CaCO3)	R20601	MS	92	2	mg/L	92	
	Hardness (As CaCO3)	R20601	MSD	94	2	mg/L	94	2.15
met_ww_icpt	Arsenic	2214	mbk	< 0.0050	0.005	mg/L		
	Cadmium	2214	mbk	< 0.0010	0.001	mg/L		
	Chromium	2214	mbk	< 0.010	0.01	mg/L		
	Lead	2214	mbk	< 0.0050	0.005	mg/L		
	Zinc	2214	mbk	< 0.010	0.01	mg/L		
	Arsenic	2214	lcs	1.915	0.005	mg/L	95.7	
	Cadmium	2214	lcs	1.944	0.001	mg/L	97.2	
	Chromium	2214	lcs	1.958	0.01	mg/L	97.9	
	Lead	2214	lcs	1.938	0.005	mg/L	96.9	
	Zinc	2214	lcs	1.921	0.01	mg/L	96	
	Arsenic	2214	ms	1.91	0.005	mg/L	95.5	
	Cadmium	2214	ms	1.962	0.001	mg/L	98.1	
	Chromium	2214	ms	1.951	0.01	mg/L	97.6	
	Lead	2214	ms	1.962	0.005	mg/L	96.5	
	Zinc	2214	ms	2.122	0.01	mg/L	99.2	
	Arsenic	2214	msd	1.901	0.005	mg/L	95	0.495
	Cadmium	2214	msd	1.94	0.001	mg/L	97	1.13
	Chromium	2214	msd	1.928	0.01	mg/L	96.4	1.18
	Lead	2214	msd	1.946	0.005	mg/L	95.7	0.841
	Zinc	2214	msd	2.096	0.01	mg/L	97.9	1.23
TSS	Suspended Solids (Residue, Non-Filt	R20608	MBLK	< 5.0	5	mg/L		
	Suspended Solids (Residue, Non-Filt	R20608	LCS	65	5	mg/L	104	
	Suspended Solids (Residue, Non-Filt	R20608	DUP	164	7	mg/L	0	2.41
	Suspended Solids (Residue, Non-Filt	R20608	DUP	32	5	mg/L	0	6.45

FIELD WATER QUALITY SAMPLING AND ANALYSIS DATA SHEET

PROJECT NAME Drum Creek PROJECT NUMBER 18042002
 SAMPLER NAME Jan Kuba PERSON PRESENT _____
 WEATHER _____ AMBIENT AIR TEMP. _____ LAST PRECIP. _____

LOCATION (STATION NO.)	L.W.C #4	Far Source #8	# 1	3
CONDITION OF WELL				
WATER SOURCES	Surface	Surface	Surface	Surface
DATE AND TIME WATER LEVEL MEASURED				
DATE AND TIME PURGED				
DATE AND TIME SAMPLED	10-27-04 11:30	10-27-04	10-27-04 14:00	10-27-04 14:33
SAMPLING METHOD	Pump	Pump	Pump	Pump
TOTAL WELL DEPTH				
WATER DEPTH "GL"				
THICKNESS OF NAPL/DNAPL	None	None	None	None
VOLUME TO EVACUATE				
PUMP RATE WHILE PURGING				
SUBSTANCE ON WATER	None			
SAMPLING TEMPERATURE	19.6	21.6	21.1	20.9
SAMPLING pH	6.43	7.43	7.59	7.15
SAMPLING SPECIFIC CONDUCTANCE	570	590	270	280
COLOR	Hazy		Hazy	Hazy
ODOR	None.		Pond	
SEDIMENT	None	None	None	None
FIELD TREATMENT PRESERVATION	Prepreserved.	Prepreserved	Prepreserved	Prepreserved
PURGING/SAMPLING PLAN				

FIELD WATER QUALITY SAMPLING AND ANALYSIS DATA SHEET

PROJECT NAME Pum Creek PROJECT NUMBER 184202
 SAMPLER NAME Jon Kubo PERSON PRESENT _____
 WEATHER _____ AMBIENT AIR TEMP. _____ LAST PRECIP. _____

LOCATION (STATION NO.)	#2 9 outfall	#5	#6	#7
CONDITION OF WELL				
WATER SOURCES	lagoon	surface	surface	surface
DATE AND TIME WATER LEVEL MEASURED				
DATE AND TIME PURGED				
DATE AND TIME SAMPLED	10/27 14:50	10/27 17:00	10/27 16:00	10/27 16:35
SAMPLING METHOD				
TOTAL WELL DEPTH				
WATER DEPTH "GL"				
THICKNESS OF NAPL/DNAPL	NONE	NONE	NONE	NONE
VOLUME TO EVACUATE				
PUMP RATE WHILE PURGING				
SUBSTANCE ON WATER				
SAMPLING TEMPERATURE	21.6	20.3 20.3	20.2	20.3
SAMPLING pH	8.14	7.81	7.64	7.45
SAMPLING SPECIFIC CONDUCTANCE	630	350	400	360
COLOR				
ODOR				
SEDIMENT	NONE	none	none	none
FIELD TREATMENT PRESERVATION				
PURGING/SAMPLING PLAN				



DIVISION OF HEALTH & ENVIRONMENTAL LABORATORIES
 Kansas Department of Health and Environment
 Forbes Field, Bldg. 740, Topeka, Kansas 66620-0001



REPORT OF ANALYSIS

INORGANIC CHEMISTRY

Report To: Bureau of Env. Remediation
 Curtis SOB, Suite 410
 ATTN: Rob Bixby
 Topeka KS 66612

Analysis Code: PT Lab Number: 443481

Site ID: 4EM80
 Account Code: EB

Collection Location: National Zinc - Low Water Crossing #4
 Collector: Rob Bixby - BER Matrix: Water
 Date/Time Collected: 10/27/04 11:25

Collect Depth:
 Date/Time Received: 10/28/04 10:06

Sample Comments:

Parameter	Analytical Result	Units	Analysis Date	Analytical Method
Aluminum	< 0.050	mg/L	11/15/04	EPA 200.7
Antimony	< 0.050	mg/L	11/15/04	EPA 200.7
Arsenic	< 0.050	mg/L	11/15/04	EPA 200.7
Barium	0.079	mg/L	11/15/04	EPA 200.7
Beryllium	< 0.0010	mg/L	11/15/04	EPA 200.7
Boron	< 0.050	mg/L	11/15/04	EPA 200.7
Cadmium	< 0.0050	mg/L	11/15/04	EPA 200.7
Calcium	41	mg/L	11/15/04	EPA 200.7
Chromium	< 0.010	mg/L	11/15/04	EPA 200.7
Cobalt	< 0.010	mg/L	11/15/04	EPA 200.7
Copper	< 0.010	mg/L	11/15/04	EPA 200.7
Iron	0.046	mg/L	11/15/04	EPA 200.7
Lead	< 0.050	mg/L	11/15/04	EPA 200.7
Magnesium	6.3	mg/L	11/15/04	EPA 200.7
Manganese	0.11	mg/L	11/15/04	EPA 200.7
Molybdenum	< 0.020	mg/L	11/15/04	EPA 200.7
Nickel	< 0.0050	mg/L	11/15/04	EPA 200.7
Potassium	5.8	mg/L	11/15/04	EPA 200.7
Selenium	< 0.050	mg/L	11/15/04	EPA 200.7
Silica	8.7	mg/L	11/15/04	EPA 200.7
Silver	< 0.010	mg/L	11/15/04	EPA 200.7
Sodium	14	mg/L	11/15/04	EPA 200.7
Thallium	< 0.050	mg/L	11/15/04	EPA 200.7
Vanadium	< 0.0050	mg/L	11/15/04	EPA 200.7
Zinc	0.0099	mg/L	11/15/04	EPA 200.7

Reporting Analyst: JAB
 Date Reported: 11/19/04
 Copies To: File

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DIVISION OF HEALTH & ENVIRONMENTAL LABORATORIES

Kansas Department of Health and Environment
Forbes Field, Bldg. 740, Topeka, Kansas 66620-0001



REPORT OF ANALYSIS

INORGANIC CHEMISTRY

Report To: Bureau of Env. Remediation
Curtis SOB, Suite 410
AttN: Rob Bixby
Topeka KS 66612

Analysis Code: PT Lab Number: 443482

Site ID: 4EM80
Account Code: EB

Collection Location: National Zinc - Far South #8
Collector: Rob Bixby - BER
Date/Time Collected: 10/27/04 12:10

Matrix: Water

Collect Depth:
Date/Time Received: 10/28/04 10:06

Sample Comments:

Table with 5 columns: Parameter, Analytical Result, Units, Analysis Date, Analytical Method. Lists various elements like Aluminum, Antimony, Arsenic, Barium, Beryllium, Boron, Cadmium, Calcium, Chromium, Cobalt, Copper, Iron, Lead, Magnesium, Manganese, Molybdenum, Nickel, Potassium, Selenium, Silica, Silver, Sodium, Thallium, Vanadium, Zinc with their respective results and methods.

Reporting Analyst: JAB
Date Reported: 11/19/04
Copies To: File

Handwritten signature of JAB

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