



C3-063-00026 (B.1)
**FINAL
APPROVED**

January 30, 2014

4/10/14 H.B.

Ms. Holly Burke Project 07-119.300
State Cooperative Program/Remedial Section
Kansas Department of Health and Environment
1000 SW Jackson Street, Suite 410
Topeka, Kansas 66612-1367

Project 07-119.300

**RE: National Zinc – Cherryvale Removal Site Evaluation - Phase I Data Report
Former National Zinc Site, Cherryvale, Kansas KDHE Project Code #C3-063-00026;
Consent Order Case #03-E-0022. Response to Comments.**

Dear Ms. Burke,

On behalf of United States Steel Corporation and Citigroup Global Market Holdings, Inc. (Respondents), please find attached the requested changes in response to comments from KDHE in the letter dated December 31, 2013 commenting on the Cherryvale Removal Site Evaluation - Phase I Data Report conducted in Cherryvale KS on August 6th and 7th 2013.

The changes or additions include the following items:

- Written field notes describing the sampled locations.
- Revised map showing the locations of the samples categorized by type and referenced to Exponent sample numbers.
- Expanded data table showing sample horizon depth, coordinates, field analytical results, and Exponent sample numbers.

Should you have any questions, please do not hesitate to contact me at (713) 468-5004.

Regards, Mark Landress P.G.
Kansas Licensed Geologist No. 793

Project Navigator, Ltd.

Attachment

Cc: William C. Anderson, Doerner, Saunders, Daniel & Anderson, L.L.P.
Jeffrey L. Rey, United States Steel Corporation
Mark Rupnow, United States Steel Corporation
Andrew G. Thiros, United States Steel Corporation
Philip Jen, PNL

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BUREAU OF
ENVIRONMENTAL REMEDIATION

04/10/2014 H.B

**Cherryvale, Kansas Bioavailability Sample Screening and Collection
Field Note Transcript**

Date: 8-5-13 Cherryvale, Kansas

Staff: Landress (PNL), Jen (PNL), Lowney (Exponent), Burke (KDHE)

Start 3:20 PM: 334 Front Street. Schaper Property. Locate sample areas. Three locations sampled. Zn, Pb elevated at each point composite from back yard. Area of thin grass with soil containing irregularly distributed 0.25-0.1.5 cm sized black colored slag dull to glassy, some vesicular with white inclusions. Occasional brick fragments. Composite 1, surface sample from dark soil with sparse slag. Exponent composite sample EX025. Sample 2 from wet area north property boundary south of railroad tracks. Bare wet area with surface material containing 0.25 to 2.5 cm sized black dull to glassy slag fragments, some vesicular. Brick, glass and metal fragments present. Exponent composite sample EX007. Material from sample 1 and 2 all similar in appearance.

4:10 PM: Contact Payne property location for access. Access refused.

4:20 PM Gill property sampling 312 Front St. Sample from back between large tree and fence. Surface 0-2 cm depth sample with sparse 0.25 to 0.75 cm sized black slag fragments. Brick and rock fragments noted near base of tree and along garden fence. XRF screen soil, select samples and composite. Collect three point composite sample near storm shelter and between fence and trees. Exponent composite sample EX029. Back of property note abundant green colored broken glass fragments in soil.

4:40 PM: 312 Front St. sample 2 from near brick sidewalk west of driveway. Surface sample of soil with black colored coarse sand 0.1-2.5 cm sized slag fragments. Exponent composite sample EX011.

5:10 PM: 335 Front St. sample near sidewalk south side of road. Three point composite near red brick sidewalk west of driveway. Surface soil below grass and moss layer. Sample of dark brown soil with occasional black slag fragments approximately 0.25 cm size with crushed red brick fragments. Exponent composite sample EX028.

End sampling 5:30 PM

Date: 8-6-13, Cherryvale, Kansas

Staff: Landress (PNL), Jen (PNL), Lowney (Exponent), Burke (KDHE)

7:30 AM: Prepare maps and plan locations for sampling.

7:45 AM: Thayer School sidewalk. Investigate location, establish location of brick sidewalk and select sample points. Five point composite from soils near sidewalk on north and south side. Composite for Thayer School sample 1. Surface soils 0-2 cm deep, dark gray to black color, occasional 0.25 cm black slag fragment, fragment approximately 0.25-2.5 cm noted near trees south of sample location. Sample complete 8:35 AM. Exponent composite sample EX022.

8:40 AM: Ball Field. North side of entry road near picnic table between bleachers and tree. XRF screen Zn/Pb no As. Bare soil area. Sample composite 1 from three locations approximately 15 feet apart, 0-2 cm below surface. Tan soil with brown to black color angular, vesicular, vitreous slag 0.25 to 0.1.5 cm in size with white inclusions and white limestone fragments from adjacent road. Composite 2. South side of tree and west of buildings south of sample 1. Tan soil with brown to black color, angular, vesicular, vitreous slag 0.25 to 1.25 cm in size with white inclusions. Finer grained well-sorted granular slag below surface. Sample 0-2 cm below surface. Exponent composite sample EX027.

9:25 AM: Logan Park. Traverse site to northwest side of park to concrete pad on north side of pole vault location. Black colored vitreous and vesicular slag 0.25 to 0.1.25 cm size. Appearance similar to ball field occurrence. Present in soil base surrounding concrete. Sample 1, 0-2 cm deep, three point surface soil composite from base of concrete pad. Exponent composite sample EX023. Move southeast across track to concession area near bleachers. Sample 2, three point composite immediately west of brick building. Bare

brown colored soil with white limestone rock fragments, brick and isolated black slag fragments. Exponent composite sample EX026.

10:20 AM: West Walnut and Park ditch. Soil with dark slag fragments up to 3 cm, irregular distribution, with red brick fragments on south side of road. Slag possibly in road base. Shallow ditch nearly filled with sediment. Note stick-up piece of 2-7/8 inch drill pipe nearby. Occasional purple colored retort fragments with vitreous fused and vesicular surface. Chat fragments noted in road and soil. Three point surface soil composite 0-2 cm below surface within 2-3 meter area. Exponent composite sample EX021.

11:15 AM: Catherine Street ditch on W. 3rd. Insufficient sample for collection.

11:20 AM: Brooks property, 212 to 216 W 3rd. Speak with Brooks' daughter notify for access. Sample 1, collected from surface soils at 212 demolished residence with apparent demolition debris burn pile. Dark gray soil, remnant burned material, glass fragments, nails, wood, red brick, concrete block, roofing material and plastic "debris" at location. Irregularly distributed black vesicular slag fragments up to several (5-8) cm in size observed. Possible mixed source material from lead paint, slag fragments and old building materials. Peeling white paint chips noted on residence at 216. XRF screen sample points. Three point composite of soils at 212 location 0-2 cm in depth. Exponent composite sample EX017. Meet Brooks' son at property 12:14 PM, discuss sampling. Collect 2nd sample from back of 216 W 3rd near play area. No slag fragments noted. 0-2 cm depth surface soil composite from below grass layer near play area south and east of fence. Exponent composite sample EX016. Burke (KDHE) leave 12:15 PM.

1:15 PM: Jewitt property 326 W. 4th. Sidewalk noted south side of property, irregular. Sample 1, single point from adjacent to brick sidewalk near southeast corner of residence where concrete and brick sidewalk join. XRF screen low lead with limited sample. No significant slag observed at surface. Exponent composite sample EX015. Sample 2 from northeast side of property. Reddish colored granular slag mixed in with 0.25 to 1.5 cm slag fragments under thin black soil used as driveway fill. Slag black to brown at surface, red color below surface with weathered appearance. XRF screen and three point composite from 0-2 cm below surface. Exponent composite sample EX024.

2:10 PM: S. Carson ditch east of school. Road edge at S. Carson north of 9th. Three locations for composite selected along east edge of road on ditch bank. Ditch 0.4-1 meter deep in areas, water flowing at time of sampling. Dark brown soils with isolated slag fragments, chat fragments, asphalt residue and limestone gravel. Some native limy sandstone ledges noted in ditch bank. Material apparently used as road base under asphalt road and road topping. Large 5-10 cm purple colored ceramic retort fragments with black vitreous fused vesicular surface. Stratified appearance of soil noted in ditch sidewall. XRF screen on soil and slag fragments. 0-2 cm sample of soil below soil surface. Composite for S. Carson ditch sample 1. Exponent composite sample EX013.

3:00 PM: E. Walnut and 2nd ditch sample. Isolated slag fragments on east side of road in ditch sidewall with the appearance of road base under asphalt. Slag, brick and native rock fragments noted on east and west side of road. Dark stratified soil layer noted below asphalt on east side by sample point. Tan-brown soil with native rock fragments, brick and slag fragments. Slag fragments variable in size up to 5-8 cm. Purple colored ceramic retort fragments with black vitreous surface. Standing water in ditch at time of sampling. XRF screen of soil adjacent to fragments. Sample composite soil 0-2 cm below surface near retort fragments along 20 foot long length in ditch side wall. Exponent composite sample EX019.

3:30 PM: First and Coyle Montgomery County Fire Department location (MCFD). North side of property in grassy area north of gravel driveway. Soil appears to be graded over and composed of imported topsoil. Three points selected along north side of property. Successive scrape in each sample point below surface grass layer in 5 cm increments until elevated XRF metal readings encountered. Samples divided into layers composite intervals A and B. (A) layer at 2 cm below grass layer and includes soil entrained in grass consisting of brown to dark brown soil with roots and organic fragments. No slag noted. Exponent composite sample EX012. (B) Sample of darker brown organic soil with roots collected between 13-15 cm below surface. Exponent composite sample EX014.

Date: 8-7-2013 Cherryvale Kansas
Staff: Landress (PNL), Jen (PNL), Lowney (Exponent)

8:00 AM: Slane property 508 W. 2nd. Three locations selected, front yard east, northeast back yard by fence, central back yard by tree west of outbuilding. XRF screen all sample points. Select surface sample (A) 0-2 cm depth sample below grass layer including soil in roots. Successive 5-cm scrape below surface at each location. Yard soils appear graded over or filled in. No smelter residue observed. Meet property owner. Property owner notes old building demolition on southeast portion of property now graded over. (B) sample approximately 20-25 cm below surface. Sample composite A and B collected. (A) Exponent composite sample EX020, (B) Exponent composite sample EX009.

9:00 AM: Booe property 524 W. 2nd. Three sample points selected, front yard west of driveway. Back yard northeast, by fence. Central yard west side. XRF screen for all samples. Successive scrape from surface in 2 cm increments. (A) sample 0-2 cm brown soil below grass layer including entrained soil in roots. (B) sample thin dark layer 5 cm below surface. No debris noted. No smelter residue observed. A and B sample composites. (A) Exponent composite sample EX008, (B) Exponent composite sample EX018.

9:40 AM: Ward property 630 W. 2nd. Flat yard appears graded in front. Three sample locations (1), front east of house. Wet, dark brown soil, glass, brick fragments, (debris) noted in surface layer under grass; no smelter residue observed. (2) Back yard by play area. Dark brown soil, debris, glass fragments, brick fragments, tar paper at 5-7 cm below surface grass irregular; no smelter residue observed. (3) Back yard east of outbuilding. Flat surface, abundant small wood pieces, brick fragments and nails, limestone gravel, occasional retort fragment. Thin vegetation. (A) composite 0-2 cm below surface. Exponent composite sample EX006. (B) composite 13-18 cm below ground surface. Exponent composite sample EX001.

10:40 AM: Valverde property 529 W. 1st. Thick grass surface cover. (1) Sample front yard northwest by tree. Dark brown organic soil. Small brick fragment debris noted 5 cm below surface. Distinct black colored soil layer at 10-12 cm below surface. (2) sample northeast property. Thick grass, possible surface fill or reworked soil uniform to 20 cm. (3) sample southeast property near phone pole. No clearly defined layer below surface. Soil uniform. No smelter residue observed. Three sample composite from A and B layer. (A) composite Exponent sample EX002. (B) composite Exponent sample EX003.

1:00 PM: Ware property 709 W. 2nd. Far west location south of rodeo grounds. Three sample points. NW property in flat. SW property west of shed on slightly elevated ground. SE of house near right of way. (A) depth sample only. Consistently dark native soil through depth 15-20 cm with no distinct layer noted. No smelter residue observed. Exponent composite sample EX004.

2:30 PM: 600 E Main sidewalk sample. Initial XRF screen of surface soil adjacent to brick. Remove brick in three locations across front of property. Black colored, sand-sized, compact, well sorted granular slag present beneath each brick. Spot XRF screen. Collect sample 0-2 cm below surface. Exponent composite sample EX005.

3:00 PM: complete residential sampling.



Sample Locations – Cherryvale, Kansas Bioavailability Sampling

Figure 1 of 19



140 feet ← N

Sample Locations – 334 Front St. Cherryvale, KS

Figure 2 of 19



334 Front #1 Sampling



334 Front #1 Soil



334 Front #1 Sample point



334 Front #2



334 Front #1 View to the South



335 Front Sidewalk

Photo Log – 334 Front St. Cherryvale, KS

Figure 3 of 19



Exponent Sample
EX011



312 Front #1



312 Front #2

Sample Locations – 312 Front St. Cherryvale, KS

Figure 4 of 19



212 W. 3rd Towards 216



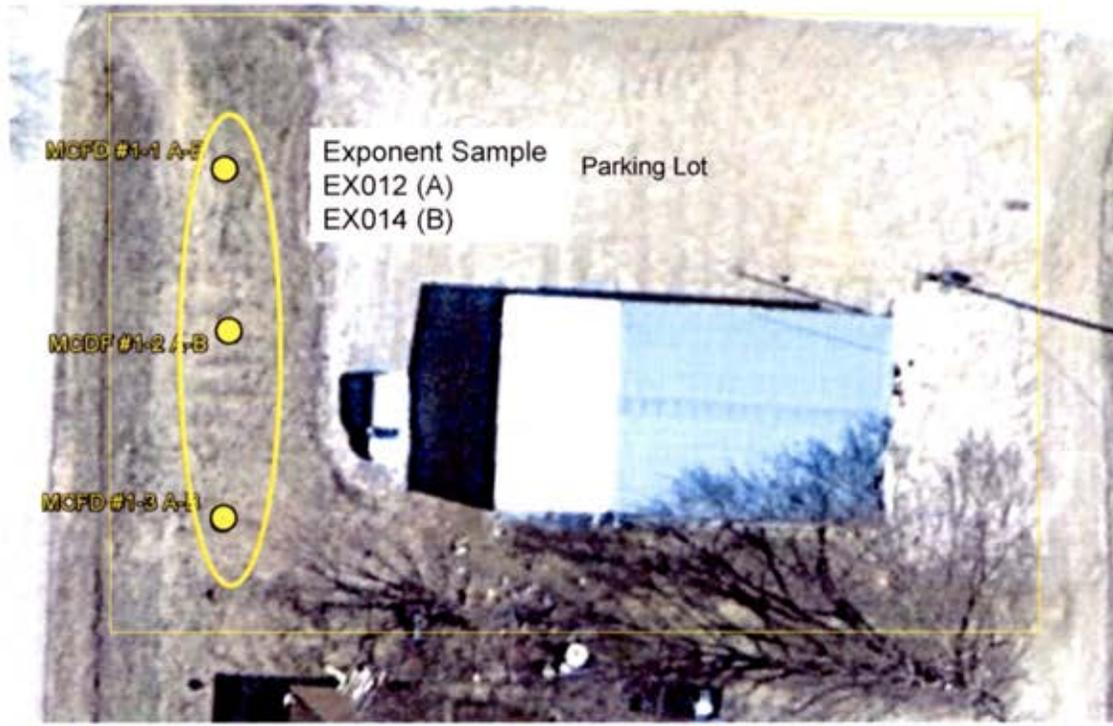
212 W. 3rd Slag Residue



216 W. 3rd #1

Sample Locations – 212-216 W. 3rd St. Cherryvale, KS

Figure 5 of 19



MCFD View East



MCFD Location #1-1



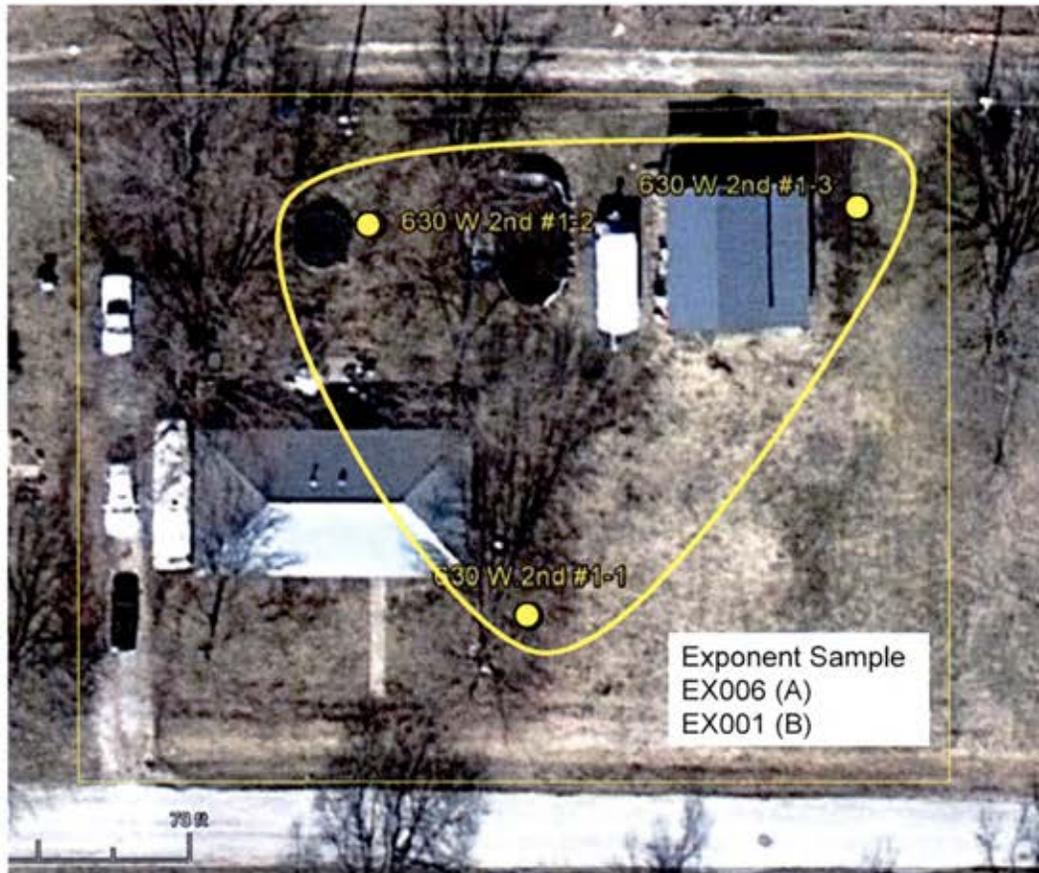
MCFD Location #1-2



MCFD Location #1-3

Sample Locations – MCFD Property Cherryvale, KS

Figure 6 of 19



630 W. 2nd #1-1



630 W. 2nd #1-3
Debris Layer (arrow)



630 W. 2nd #1-2



630 W. 2nd #1-3

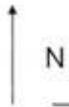


Slag and debris fragments

630 W. 2nd #1-3 Detail

Sample Locations – 630 W. 2nd St. Cherryvale, KS

Figure 7 of 19



65 feet

Exponent Sample
EX008 (A)
EX018 (B)

524 W. 2nd #1-1



524 W. 2nd #1-2



524 W. 2nd #1-3



Sample Locations – 524 W. 2nd St. Cherryvale, KS

Figure 8 of 19



508 W. 2nd #1-1



508 W. 2nd #1-2



508 W. 2nd #1-3



Sample Locations –508 W. 2nd Cherryvale, KS

Figure 9 of 19



709 W. 2nd #1-1

709 W. 2nd #1-2

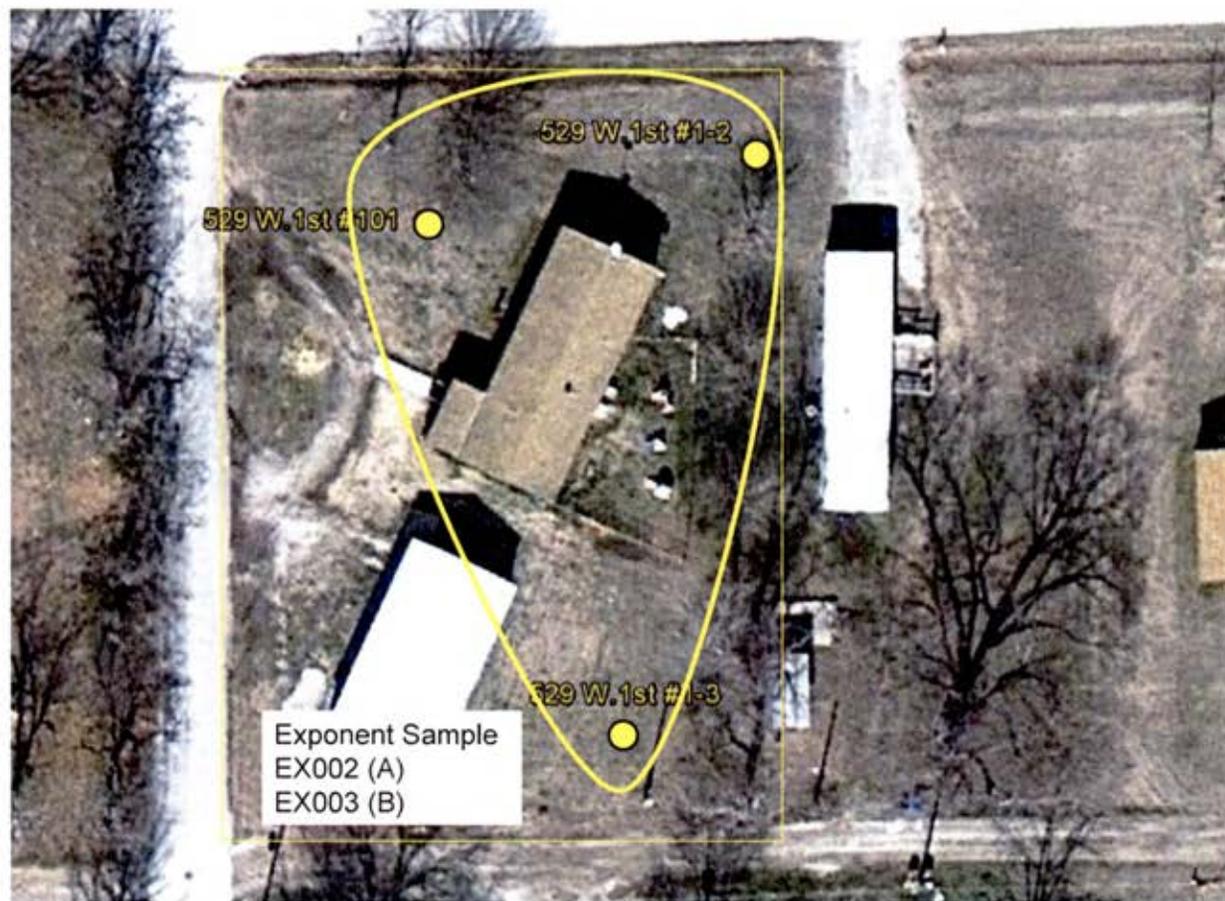
709 W. 2nd #1-2

709 W. 2nd #1-3

709 W. 2nd #1-3

Sample Locations – 709 W. 2nd St. Cherryvale, KS

Figure 10 of 19



529 W. 1st #1-1



529 W. 1st #1-2



529 W. 1st #1-1



529 W. 1st #1-3



529 W. 1st #1-2



529 W. 1st #1-3

Sample Locations – 529 W. 1st St. Cherryvale, KS

Figure 11 of 19



170 feet



View West



View East

Sample Locations – Thayer School Cherryvale, KS

Figure 12 of 19



326 W. 4th #1



326 W. 4th #1



326 W. 4th #2



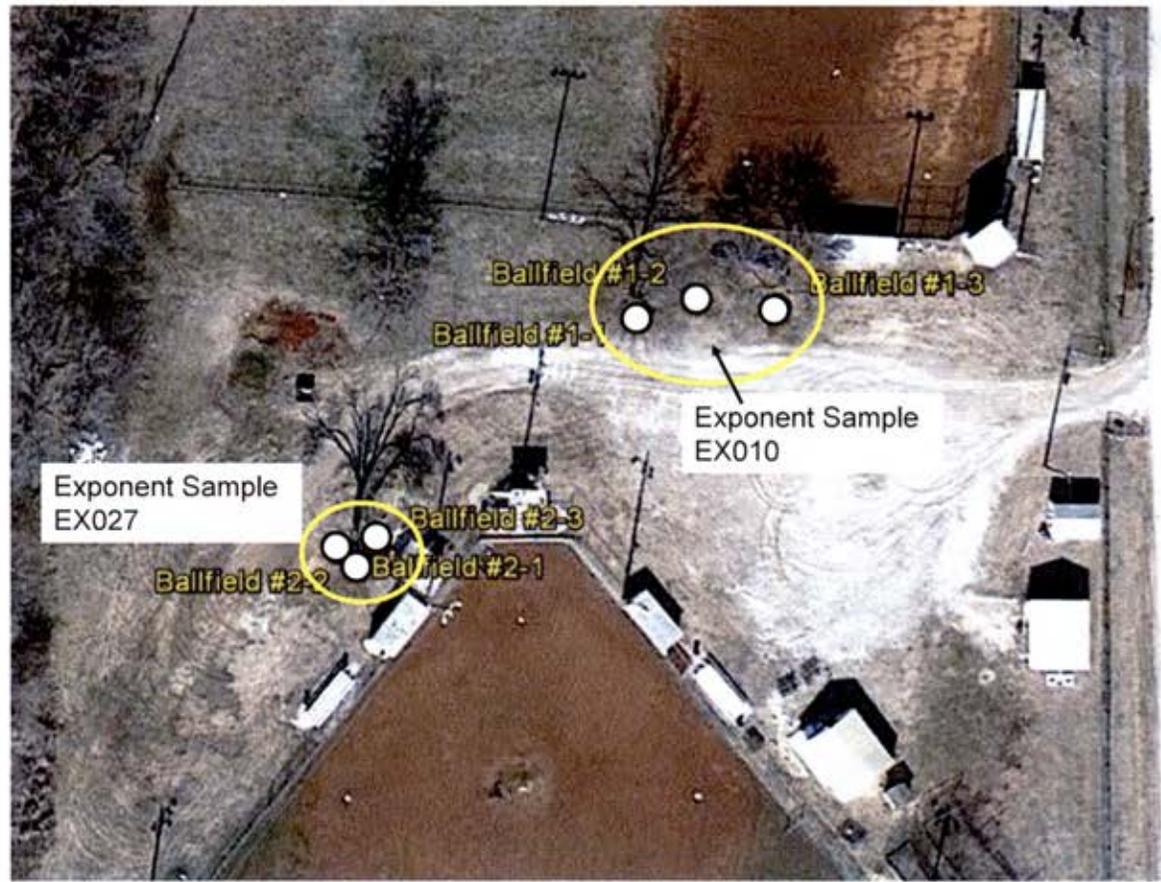
326 W. 4th #2



326 W. 4th #2

Sample Locations – 326 W. 4th St. Cherryvale, KS

Figure 13 of 19



Ball Field #1



Ball Field #1



Ball Field #2

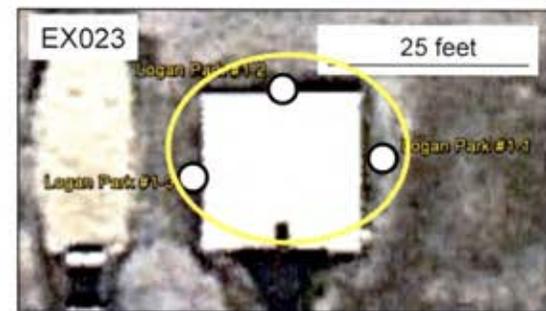
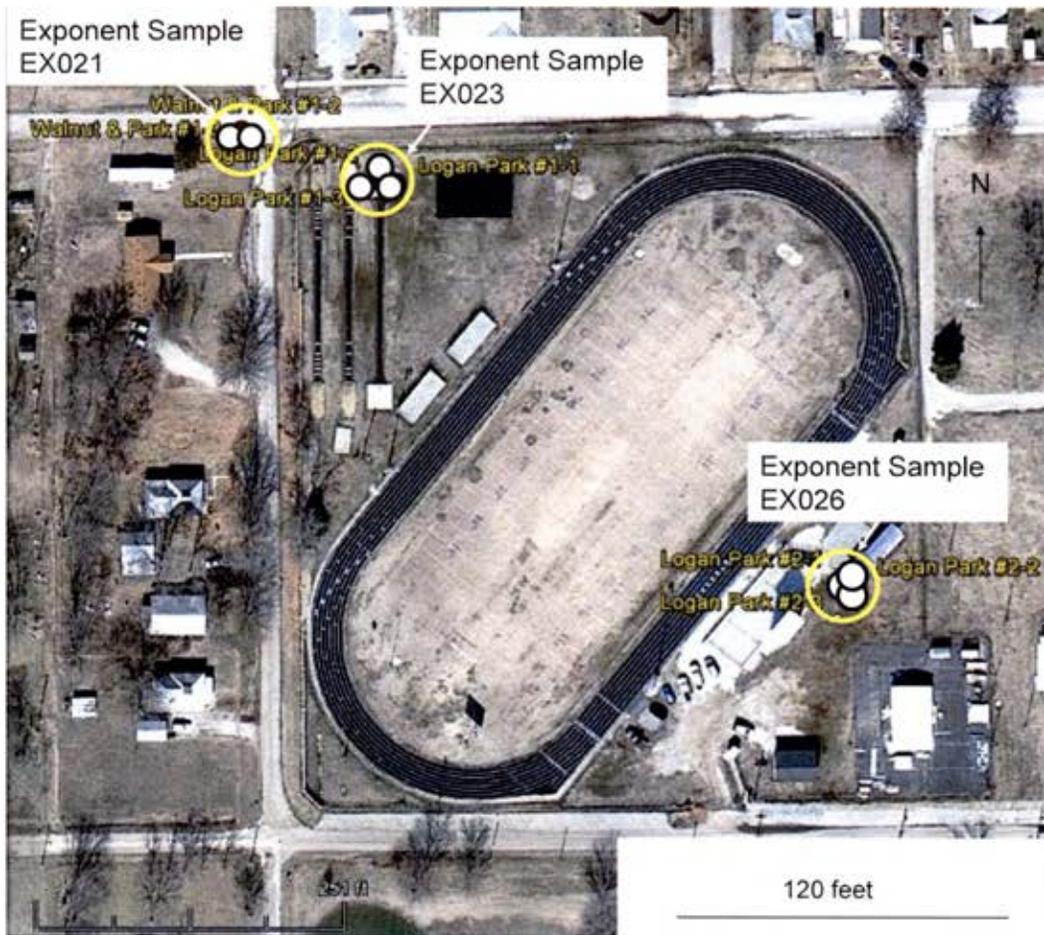


Ball Field #2



Sample Locations – Cherryvale Ball Field Cherryvale, KS

Figure 14 of 19



Sample Locations – Logan Park, Walnut & Park St., Cherryvale, KS

Figure 15 of 19



EX021



EX021

Walnut & Park Ditch



EX023



EX023

Logan Park #1



EX026

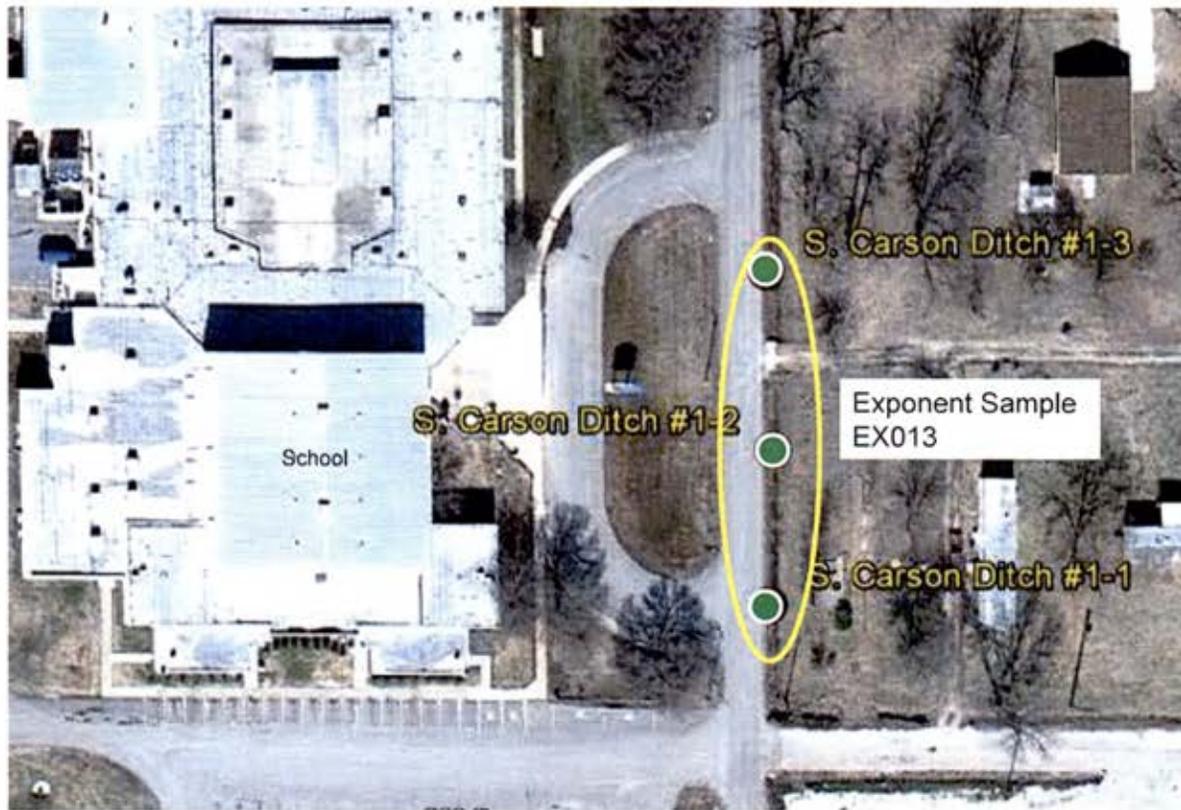


EX026

Logan Park #2

Photo Log – Logan Park, Walnut & Park St., Cherryvale, KS

Figure 16 of 19



View North



View North



View South



View West



Slag Fragments Near Sample 1-2



Slag Fragments Near Sample 1-3

Sample Locations – S. Carson Ditch, Cherryvale, KS

Figure 17 of 19



View West



Slag Under Brick



Brick Under Grass



Slag Under Brick

Sample Locations – 600 East Main, Cherryvale, KS

Figure 18 of 19



N ↑
 35 feet



View North



Slag Fragments in Soil

Sample Locations – Walnut & E. 2nd Ditch, Cherryvale, KS

Figure 19 of 19

National Zinc Cherryvale Kansas. Bioavailability Sample XRF Field Screen Analysis

Location	Exponent Soil ID	Material	Sample Type	Horizon	Depth (cm)	X Coordinate	Y Coordinate	Zn (mg/kg)	Zn +/-	As (mg/kg)	As +/-	Cd (mg/kg)	Cd +/-	Pb (mg/kg)	Pb +/-
212 W. 3rd #1	EX017	Soil with slag	Residential slag/waste	A	0-2	2169675	1545598	3688	81	<LOD		<LOD		1912	151
216 W. 3rd #1	EX016	Soil	Residential slag/waste	A	0-2	2169594	1545707	832	26	<LOD		<LOD		170	19
312 Front # 1	EX029	Soil	Residential slag/waste	A	0-2	2169156	1546806	1316	28	<LOD		<LOD		221	14
312 Front Sidewalk	EX011	Soil	Sidewalk Underlayment	A	0-2	2169121	1546648	2395	46	<LOD		<LOD		177	8
326 4th #1	EX015	Soil	Residential slag/waste	A	0-2	2169099	1544797	1095	28	<LOD		<LOD		255	15
326 4th #2	EX024	Soil with slag	Residential slag/waste	A	0-2	2169180	1544920	2483	48	44	7	<LOD		129	11
326 4th #2 dup 1	EX024	Soil with slag	Field XRF Duplicate	A	0-2	2169180	1544920	3297	62	89	9	<LOD		132	15
326 4th #2 dup 2	EX024	Soil with slag	Field XRF Duplicate	A	0-2	2169180	1544920	2758	53	68	8	<LOD		125	15
326 4th #2 dup 3	EX024	Soil with slag	Field XRF Duplicate	A	0-2	2169180	1544920	2747	55	40	8	<LOD		146	17
326 4th #2 dup 4	EX024	Soil with slag	Field XRF Duplicate	A	0-2	2169180	1544920	2679	52	44	8	<LOD		135	9
334 Front #1	EX025	Soil with slag	Residential slag/waste	A	0-2	2168876	1546828	9376	153	77	21	<LOD		1424	13
334 Front #2	EX007	Soil with slag	Residential slag/waste	A	0-2	2168903	1547025	4513	87	<LOD		<LOD		635	10
334 Front #2 dup	EX007	Soil with slag	Field XRF Duplicate	A	0-2	2168903	1547025	4580	94	74	15	<LOD		523	10
335 Front Sidewalk	EX028	Soil with slag	Sidewalk Underlayment	A	0-2	2168903	1546581	6132	100	<LOD		<LOD		546	7
508 W. 2nd A	EX020	Soil	Historical Aerial Deposition	A	0-2	2168437	1545952	853	25	<LOD		<LOD		97	20
508 W. 2nd B	EX009	Soil	Historical Aerial Deposition	B	20-25	2168437	1545952	1678	47	<LOD		<LOD		262	11
524 W. 2nd A	EX008	Soil	Historical Aerial Deposition	A	0-2	2168149	1545947	1444	32	<LOD		<LOD		325	46
524 W. 2nd B	EX018	Soil	Historical Aerial Deposition	B	5-8	2168149	1545947	1450	36	<LOD		<LOD		345	25
529 W. 1st A	EX002	Soil	Historical Aerial Deposition	A	0-2	2168014	1546166	933	25	<LOD		<LOD		144	21
529 W. 1st A dup	EX002	Soil	Field XRF Duplicate	A	0-2	2168014	1546166	1014	27	<LOD		<LOD		156	20
529 W. 1st B	EX003	Soil	Historical Aerial Deposition	B	10-12	2168014	1546166	4699	87	<LOD		<LOD		581	14
600 Main Sidewalk	EX005	Granular Slag	Sidewalk Underlayment	A	0-2	2172168	1545107	111346	2565	<LOD		104	33	5701	11
630 2nd B	EX001	Soil	Historical Aerial Deposition	B	13-18	2167648	1545919	2076	45	<LOD		<LOD		498	17
630 W. 2nd A	EX006	Soil	Historical Aerial Deposition	A	0-2	2167648	1545919	1359	31	<LOD		<LOD		465	12
630 W. 2nd A dup 2	EX006	Soil	Field XRF Duplicate	A	0-2	2167648	1545919	1298	30	<LOD		<LOD		470	9
630 W. 2nd A dup 1	EX006	Soil	Field XRF Duplicate	A	0-2	2167648	1545919	891	23	<LOD		<LOD		253	9
709 W. 2nd A	EX004	Soil	Historical Aerial Deposition	A	0-2	2167210	1545723	988	24	<LOD		<LOD		90	7
Balfield #1	EX010	Soil and slag	Parks/Fields	A	0-2	2170115	1542799	597	22	<LOD		<LOD		25	15
Balfield #1 dup	EX010	Soil and slag	Field XRF Duplicate	A	0-2	2170115	1542799	597	22	25	6	<LOD		<LOD	
Balfield #2	EX027	Soil with slag	Parks/Fields	A	0-2	2169991	1542679	3692	78	<LOD		<LOD		<LOD	
Logan Park #1	EX023	Soil and slag	Parks/Fields	A	0-2	2167857	1544095	5831	114	<LOD		<LOD		78	9
Logan Park #1 dup	EX023	Soil and slag	Field XRF Duplicate	A	0-2	2167857	1544095	5916	125	29	9	<LOD		48	17
Logan Park #2	EX026	Soil	Parks/Fields	A	0-2	2168225	1543801	846	26	<LOD		<LOD		92	9
MCFD A	EX012	Soil	Historical Aerial Deposition	A	0-2	2168432	1546199	1988	43	<LOD		<LOD		380	33
MCFD B	EX014	Soil	Historical Aerial Deposition	B	13-15	2168432	1546199	2363	53	<LOD		<LOD		441	19
S. Carson Ditch #1	EX013	Soil	Ditches	A	0-2	2171824	1543100	9120	166	73	15	<LOD		467	11
Thayer School # 1	EX022	Soil minor slag	Sidewalk Underlayment	A	0-2	2167881	1545464	2917	53	<LOD		<LOD		375	9
Walnut & Second Ditch	EX019	Soil	Ditches	A	0-2	2173095	1545793	3118	61	<LOD		<LOD		201	9
Walnut and Park Ditch	EX021	Soil minor slag	Ditches	A	0-2	2167745	1544141	18158	305	<LOD		<LOD		278	9
Walnut and Park Ditch dup 1	EX021	Soil	Field XRF Duplicate	A	0-2	2167745	1544141	9764	155	<LOD		<LOD		132	10
Walnut and Park Ditch dup 2	EX021	Soil	Field XRF Duplicate	A	0-2	2167745	1544141	20126	322	<LOD		<LOD		359	9

Coordinates - State Plane Coordinate System Kansas South in feet. Approximately located from aerial photography.

Depth: (A) 0-2 cm below surface including base of grass layer. (B) variable depth depending on field analysis.

Field screening analysis using Innovex Alpha portable XRF soil mode on as-received samples. Samples not dried.

All values in mg/kg. Work performed 8-5-2013 to 8-7-2013 by Project Navigator, Ltd.