HRS DOCUMENTATION RECORD COVER SHEET

Name of Site: **Former United Zinc & Associated Smelters**
EPA ID No.: **KSN000705026**

Contact Persons

EPA Contact: Michelle Quick
U.S. Environmental Protection Agency (EPA), Region 7
901 North 5th Street
Kansas City, Kansas 66101
(913) 551-7335

Documentation Record: Kumud Pyakuryal, Tetra Tech EM Inc.

Pathways, Components, or Threats Not Scored

Ground water is not used as a significant resource in the immediate vicinity of the site; therefore, the ground water pathway does not contribute to the overall Hazard Ranking System (HRS) score. No releases or impacts to surface water or air have been scored; therefore, the surface water and air pathways were not evaluated. The ground water migration, surface water migration, and air migration pathways were not evaluated due to lack of analytical data and/or targets, and because these pathways would not affect the NPL decision.

A78Q 40414342 1.0
Superfund
OU00 ES
30290958

HRS DOCUMENTATION RECORD

Name of Site:	Former United Zinc & Associated Smelters
EPA Region:	7
Date Prepared:	September 2012
Street Address of Site*: City, County, State, zip:	Highway 54 & Kansas Drive Iola, Allen County, Kansas 66749
General Location in the State:	The site is located in and around Iola, Allen County, Kansas (Ref. 3, p. 1).
Topographic Map:	The location of site is shown on the Iola, Kansas, Quadrangle, U.S. Geological Survey, 7.5-Minute Series Topographic Map (Ref. 3, p. 1).
Latitude:	37.92228° North (Ref. 3, p. 1) (see Figure 1)
Longitude:	95.38590° West (Ref. 3, p. 1) (see Figure 1)

The latitude and longitude listed above specify the approximate location of the Former United Zinc #1 facility associated with the Former United Zinc & Associated Smelters site. Figure 1 shows this facility property location.

Scores

Ground Water Pathway	Not Scored
Surface Water Pathway	Not Scored
Soil Exposure Pathway	100.00
Air Pathway	Not Scored
HRS SITE SCORE	50.00

* - The street address, coordinates, and contaminant locations presented in this HRS documentation record identify the general area the site is located. They represent one or more locations EPA considers to be part of the site based on the screening information EPA used to evaluate the site for NPL listing. EPA lists national priorities among the known "releases or threatened releases" of hazardous substances; thus, the focus is on the release, not precisely delineated boundaries. A site is defined as where a hazardous substance has been "deposited, stored, placed, or otherwise come to be located." Generally, HRS scoring and the subsequent listing of a release merely represent the initial determination that a certain area may need to be addressed under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA). Accordingly, EPA contemplates that the preliminary description of facility boundaries at the time of scoring will be refined as more information is developed as to where the contamination has come to be located.

WORKSHEET FOR COMPUTING HRS SITE SCORE

		S	S^2
1.	Ground Water Migration Pathway Score (S_{gw})	Not Scored	
2a.	Surface Water Overland/Flood Migration Component (from Table 4-1, line 30)	Not Scored	
2b.	Ground Water to Surface Water Migration Component (from Table 4-25, line 28)	Not Scored	
2c.	Surface Water Migration Pathway Score (S_{sw}) Enter the larger of lines 2a and 2b as the pathway score.	Not Scored	
3.	Soil Exposure Pathway Score (S_s) (from Table 5-1, line 22)	100.00	10,000
4.	Air Migration Pathway Score (S_a) (from Table 6-1, line 12)	Not Scored	
5.	Total of $S_{gw}^2 + S_{sw}^2 + S_s^2 + S_a^2$		10,000
6.	**HRS Site Score** Divide the value on line 5 by 4 and take the square root	50.00	

SOIL EXPOSURE PATHWAY SCORESHEET

(Ref. 1, Table 5-1)

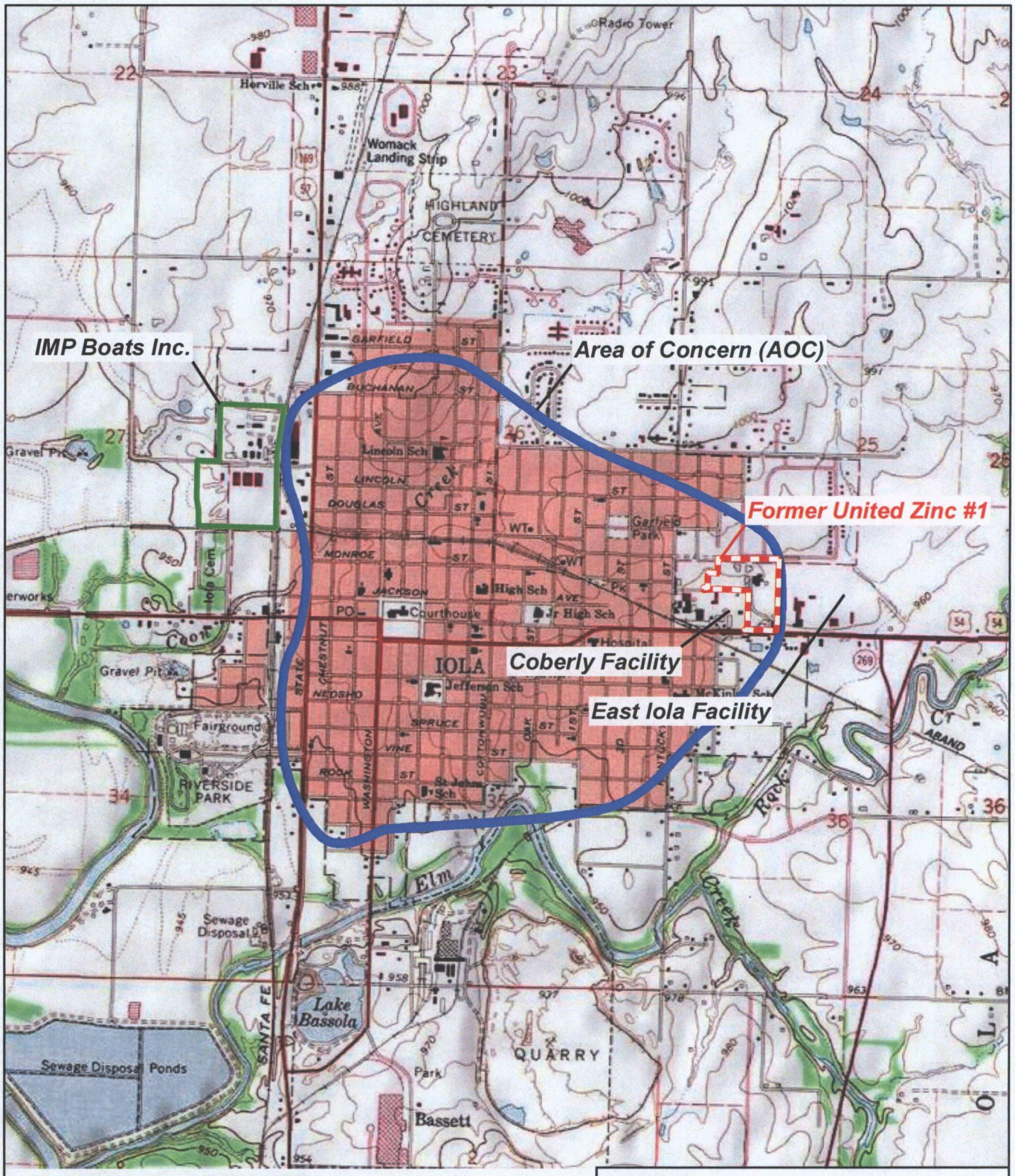
Factor Categories and Factors	Maximum Value	Value Assigned
RESIDENT POPULATION THREAT		
Likelihood of Exposure		
1. Likelihood of Exposure	550	550
Waste Characteristics		
2. Toxicity	a	10,000
3. Hazardous Waste Quantity	a	10
4. Waste Characteristics	100	18
Targets		
5. Resident Individual	50	45
6. Resident Population		
6a. Level I Concentrations	b	0
6b. Level II Concentrations	b	835.04
6c. Resident Population (lines 6a + 6b)	b	835.04
7. Workers	15	5
8. Resources	5	0
9. Terrestrial Sensitive Environments	c	0
10. Targets (lines 5 + 6c + 7 + 8 + 9)	b	885.04
Resident Population Threat Score		
11. Resident Population Threat (1 x 4 x 10)	b	8,761,896

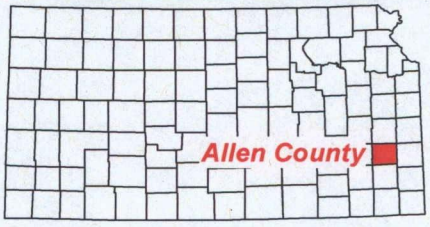
SOIL EXPOSURE PATHWAY SCORESHEET (Continued)

(Ref. 1, Table 5-1)

Factor Categories and Factors	Maximum Value	Value Assigned
NEARBY POPULATION THREAT		
Likelihood of Exposure		
12. Attractiveness/Accessibility	100	NS
13. Area of Contamination	100	NS
14. Likelihood of Exposure	500	NS
Waste Characteristics		
15. Toxicity	a	NS
16. Hazardous Waste Quantity	a	NS
17. Waste Characteristics	100	NS
Targets		
18. Nearby Individual	1	NS
19. Population Within 1 Mile	b	NS
20. Targets (lines 18 + 19)	b	NS
Nearby Population Threat Score		
21. Nearby Population Threat (lines 14 x 17 x 20)	b	NS
SOIL EXPOSURE PATHWAY SCORE		
22. Soil Exposure Pathway Score[d] (S_g), (lines [11 + 21] / 82,500, subject to maximum of 100)	100	100.00

[a] Maximum value applies to waste characteristics category.
[b] Maximum value not applicable.
[c] No specific maximum value applies to factor. However, pathway score based solely on terrestrial sensitive environments is limited to maximum of 60.
[d] Do not round to nearest integer.
NS=Not Scored





N

0 1,000 2,000

Feet

Source: USGS Allen County, KS 7.5 Minute Topo Quad, 1984

X:\G\9004\0256\Projects\mxd\Figure1.mxd

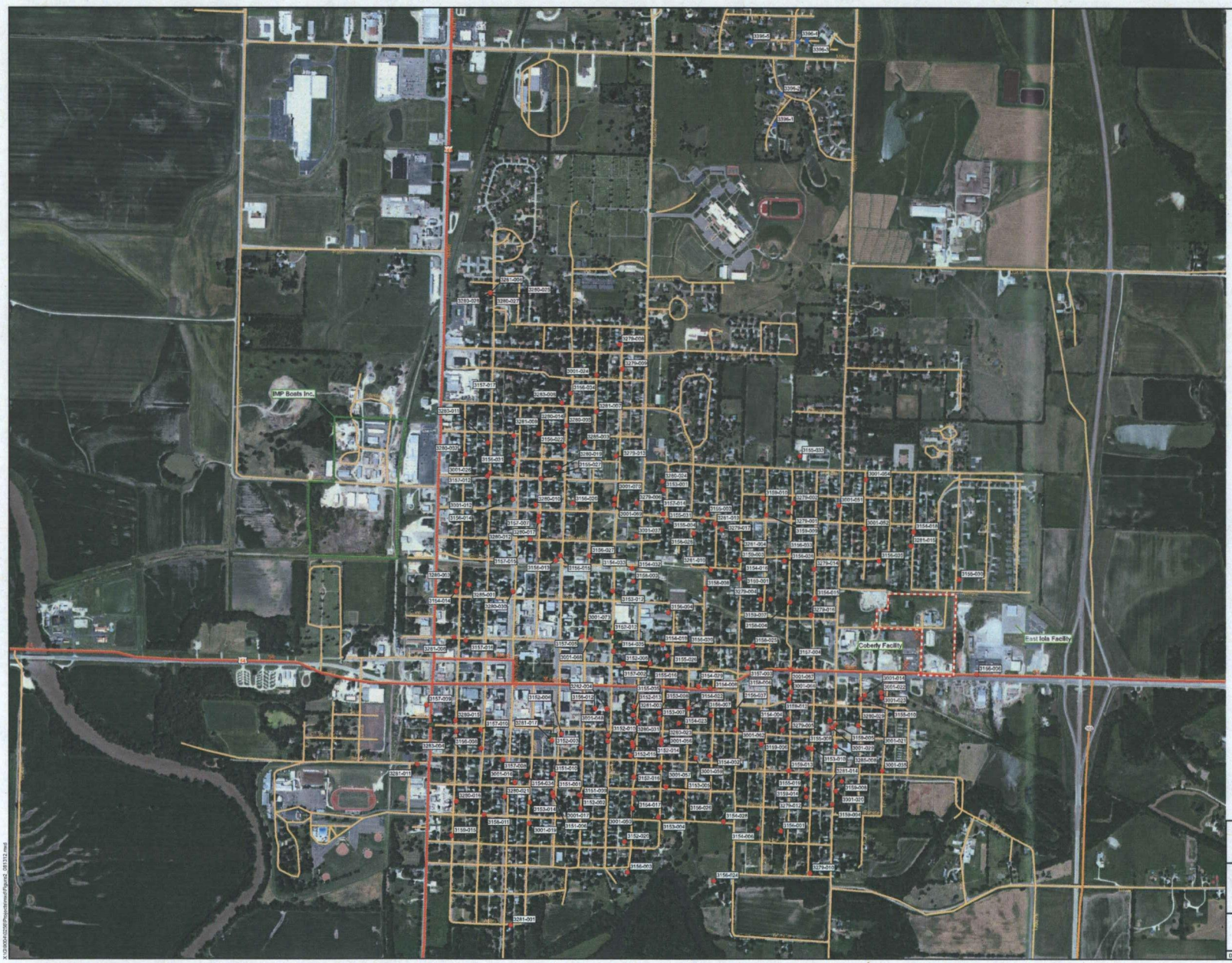
Former United Zinc and Associated Smelters
Iola, Kansas

Figure 1

Area Location Map

TETRA TECH EM INC.

Date: 7/27/2012 Drawn By: Gustavo Orozco Project No: X9004.L11.0256.000



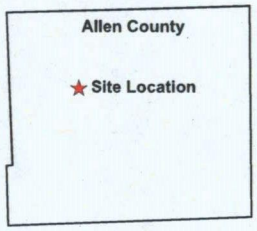
Legend

- Background location
- Lead Results > 366 ppm
- Schools
- Former United Zinc #1
- Slag Pile
- Highway
- Major Road
- Local Road
- Minor Road
- Other Road

ppm parts per million

County Locator

Site Locator



N

0 600 1,200

Scale in Feet

Source: Allen Co., Kansas DOQQ Tileset, 2003
ESRI Data Maps, Bing Maps Aerial, 2010

Former United Zinc and Associated Smelters
Iola, Kansas

Figure 2
Areas of Observed Contamination
(Lead > 366 parts per million)

TETRA TECH EM INC.

Date: 8/16/2012 Drawn By: Gustavo Orozco Project No: X9004.L11.0256.000

Figure Notes:

1. The currently identified property boundary for the Former United Zinc #1 facility does not represent the historical property boundary for the smelting facility. It is meant to illustrate the approximate portion of the historical property that is included for consideration in this evaluation due to the participation of relevant properties in the state of Kansas' voluntary cleanup and redevelopment program.

2. Parts per million is equal to milligrams per kilogram (mg/kg) provided as units of measurement in the analytical data tables in this HRS documentation record.

REFERENCES

Ref. No.	Description of the Reference
1.	U.S. Environmental Protection Agency (U.S. EPA). Hazard Ranking System, Final Rule, 40 *Code of Federal Regulations* Part 300, Volume 55, No. 241. December 14, 1990. On-Line Address: http://www.epa.gov/superfund/sites/npl/hrsres/#HRS%20Rule. 1 page. (A complete copy of the Hazard Ranking System can be obtained at the Regional docket upon request.)
2.	U.S. EPA. Superfund Chemical Data Matrix (SCDM). March 2012. Excerpt. 9 pages. A complete copy of SCDM is available at http://www.epa.gov/superfund/sites/npl/hrsres/tools/scdm.htm.
3.	U.S. Geological Survey (USGS). 7.5-Minute Series Topographic Map of Iola, Kansas Quadrangle. 1966. Photo revised 1984. 1 page.
4.	Tetra Tech EM Inc. 2008. Site Inspection Report for the United Zinc No. 1 Site in Iola, Kansas. January 18. 81 pages. U.S. EPA Region 7.
5.	Reference Number Reserved.
6.	Tetra Tech EM Inc. 2007. Quality Assurance Project Plan for Additional Removal Site Evaluation Activities, United Zinc No. 1, Iola, Kansas. Task Order No. 0038. Superfund Technical Assessment and Response Team (START) 3 Contract. February 28. 24 pages.
7.	Tetra Tech, EM Inc. 2006. Quality Assurance Project Plan for an Integrated Site Assessment of the United Zinc #1 Site, Iola, Allen County, Kansas. Task Order 0011. (Superfund Technical Assessment and Response Team) START Contract. April 7. 16 pages.
8.	Maxim Technologies, Inc. (Maxim). 2003. Focused Former Smelter Phase I Report. Group B Smelters. United Zinc #1, Iola, Kansas. December 19. Excerpt 24 pages.
9.	Burns & McDonnell Engineering Company Inc. (Burns & McDonnell). 2004. Appendix F: Phase II Focused Former Smelter Assessment of the Former United Zinc #1 Smelter, Iola, Kansas. December. 32 pages.
10.	Kansas Department of Health and Environment (KDHE). Bureau of Environmental Remediation/Remedial Section. 2006. "A Short History of the Zinc Smelting Industry in Kansas." December 28. 16 pages.
11.	Reference Number Reserved.
12.	Tetra Tech. 2007. Preliminary Assessment report for the United Zinc #1 Site in Iola, Kansas. February 20. 377 pages.
13.	U.S. EPA Region 7 (Barry Evans). 2007. HRS Analysis Results Supplement for ASR # 3155 for the United Zinc No. 1 Site. March 27. 7 pages.
14.	U.S. EPA Region 7 (Barry Evans). 2007. HRS Analysis Results Supplement for ASR # 3156 for the United Zinc No. 1 Site. March 27. 8 pages.

REFERENCES (Continued)

Ref. No.	Description of the Reference
15.	U.S. EPA Region 7 (Barry Evans). 2007. HRS Analysis Results Supplement for ASR # 3157 for the United Zinc No. 1 Site. March 27. 4 pages.
16.	U.S. EPA Region 7 (Barry Evans). 2007. HRS Analysis Results Supplement for ASR # 3158 for the United Zinc No. 1 Site. March 27. 3 pages.
17.	U.S. EPA Region 7 (Barry Evans). 2007. HRS Analysis Results Supplement for ASR # 3151 for the United Zinc No. 1 Site. March 27. 3 pages.
18.	U.S. EPA Region 7 (Barry Evans). 2007. HRS Analysis Results Supplement for ASR # 3152 for the United Zinc No. 1 Site. March 27. 4 pages.
19.	U.S. EPA Region 7(Barry Evans). 2007. HRS Analysis Results Supplement for ASR # 3153 for the United Zinc No. 1 Site. March 27. 4 pages.
20.	U.S. EPA Region 7 (Barry Evans). 2007. HRS Analysis Results Supplement for ASR # 3154 for the United Zinc No. 1 Site. March 27. 6 pages.
21.	Reference Number Reserved.
22.	Kansas Department of Health and Environment (KDHE). 2005. Preliminary Removal Site Evaluation for: United Zinc Smelter #1 Site in Iola, Kansas. September. Excerpt 54 pages.
23.	Terranext. 2005. Appendix G: Residential Yard Soil Sampling Report: United Zinc #1 in Iola, Kansas. June 27. Excerpt 5 pages.
24.	Tetra Tech EM Inc. (Tetra Tech). 2006. Removal Site Evaluation Report for United Zinc #1 Site, Iola, Kansas. September 26. 510 pages.
25.	Kansas Department of Health and Environment (KDHE). 2007. Risk-Based Standards for Kansas Manual – 4th Version. June. 52 pages.
26.	United Stated Department of Agriculture. 1978. Soil Survey of Allen County, Kansas. November. Excerpt 8 pages. A complete copy of the soil survey is available on-line at: http://soils.usda.gov/survey/online_surveys/kansas/KS001/allen.pdf.
27.	Reference Number Reserved.
28.	Reference Number Reserved.
29.	U.S Census Bureau. 2012. Allen County, Kansas Census Data. On-line address: http://quickfacts.census.gov/qfd/states/20/20001.html. Accessed on April 6. 2 pages.
30.	Reference Number Reserved.
31.	City of Iola. 2008. Official website for City of Iola, Kansas: City History. On-line Address: http://www.cityofiola.com/history.html. Accessed on July 1. 6 pages.

REFERENCES (Continued)

Ref. No.	Description of the Reference
32.	Reference Number Reserved.
33.	Kansas State University (KSU). 2012. Correspondence from Mary Knapp, State Climatologist, KSU, to Kumud Pyakuryal, Tetra Tech, Inc. Historical Wind Data/Wind Rose. July 25. Excerpt 45 pages.
34.	Kansas Department of Health and Environment (KDHE). 2012. Correspondence forwarded from Michelle Quick, U.S. EPA Region 7 NPL Coordinator, to Tetra Tech regarding Voluntary Cleanup Program Sites in Iola, Kansas. March 21. 5 pages.
35.	Chenega Global Services, LLC (Chenega). 2010. Former United Zinc Smelter, Iola, Allen County, KS: Potentially Responsible Party (PRP) Report. Prepared for U.S. EPA Region 7. July. 35 pages.
36.	Chenega Global Services, LLC (Chenega). 2010. East Iola Smelter Site, Iola, Allen County, KS: Potentially Responsible Party (PRP) Report. Prepared for U.S. EPA Region 7. August. 40 pages.
37.	Chenega Global Services, LLC (Chenega). 2010. IMP Boats, Iola, Allen County, KS: Potentially Responsible Party (PRP) Report. Prepared for U.S. EPA Region 7. August. 35 pages.
38.	Reference Number Reserved.
39.	Public School Review. 2012. Statistical Data for Jefferson Elementary School, Iola, Allen County, Kansas. On-line Address: http://www.publicschoolreview.com/town_schools/stateid/KS/townid/6216. Accessed on April 6. 6 pages
40.	Tetra Tech EM Inc. (Tetra Tech). 2008. Removal Action Summary Report, United Zinc #1 Site – Iola, Kansas. May 15. 2568 pages (Appendix B – Photographic Documentation CD not included).
41.	Claytor, Rick. 2012. Memo to File: Former United Zinc Site, Iola, Kansas post excavation details. July 23: 5 pages.
42.	Kansas Department of Health and Environment (KHDE). 2012. Preliminary Assessment 2, IMP Boats Site (Lanyon #1 and #2), Iola, KS. June. 206 pages.
43.	U.S. EPA Region 7 (Barry Evans). 2012. HRS Analysis Results Supplement for ASR # 3001 for the United Zinc No. 1 Site. July 30. 15 pages.
44.	U.S. EPA Region 7 (Barry Evans). 2012. HRS Analysis Results Supplement for ASR # 3159 for the United Zinc No. 1 Site. July 30. 4 pages.
45.	Reference Number Reserved.

REFERENCES (Continued)

Ref. No.	Description of the Reference
46.	U.S. EPA Region 7 (Barry Evans). 2012. HRS Analysis Results Supplement for ASR # 3279 for the United Zinc No. 1 Site. July 30. 4 pages.
47.	U.S. EPA Region 7 (Barry Evans). 2012. HRS Analysis Results Supplement for ASR # 3280 for the United Zinc No. 1 Site. July 30. 7 pages.
48.	U.S. EPA Region 7 (Barry Evans). 2012. HRS Analysis Results Supplement for ASR # 3281 for the United Zinc No. 1 Site. July 30. 4 pages.
49.	U.S. EPA Region 7 (Barry Evans). 2012. HRS Analysis Results Supplement for ASR # 3282 for the United Zinc No. 1 Site. July 30. 2 pages.
50.	U.S. EPA Region 7 (Barry Evans). 2012. HRS Analysis Results Supplement for ASR # 3283 for the United Zinc No. 1 Site. July 30. 2 pages.
51.	Reference Number Reserved.
52.	U.S. EPA Region 7 (Barry Evans). 2012. HRS Analysis Results Supplement for ASR # 3285 for the United Zinc No. 1 Site. July 30. 2 pages.
53.	Tetra Tech, Inc. 2012. Record of Communication between Kumud Pyakuryal and Rick Claytor, United Zinc Removal Action Project Manager (Tetra Tech Region 7 START Team Member). August 17. 1 page.
54.	Tetra Tech, Inc. 2012. Record of Communication between Kumud Pyakuryal and Courtney Orth, School Secretary, McKinley Elementary School, Iola, Kansas. August 17. 1 page.

1.0 SITE DESCRIPTION AND GENERAL COMMENTS

1.1 SITE DESCRIPTION

The Former United Zinc & Associated Smelters site is located in and around the city of Iola, Allen County, Kansas, west of Highway 169, but excludes any areas that are currently known to be uncontaminated or are being addressed by other regulatory programs; a known list of facilities that are currently participating in the state voluntary cleanup programs (e.g., Voluntary Cleanup and Property Redevelopment Program [VCPRP]) are catalogued and depicted in Reference 34 (Ref. 34, pp. 3-5). For HRS purposes the site is therefore defined as comprising the following: the releases of hazardous substances to the atmosphere, or other pathways, from all historical smelter operations (including, but not limited to those identified below) that operated in and around Iola, Kansas and the resulting contaminated soil. Contamination related to past smelters that operated in the area extends into numerous residential properties stretching westward from Highway 169 along both sides of Highway 54 up to near State Highway 169 (Figure 2 of this HRS documentation record).

Some of the historical smelters that operated primarily between 1902 and 1925 are known as Former United Zinc #1, East Iola, Coberly, and Lanyon #1 and #2 (also referred to as IMP Boats in this HRS documentation record). The United Zinc & Chemical Company owned the United Zinc smelter (also known as Former United Zinc #1 in this HRS documentation record), depicted on page 18 of Reference 35, from 1902 until 1925 and operated a smelter at this location from 1902 to 1910 (Ref. 35, pp. 9, 15). A smelter operated on the East Iola property, depicted on page 15 of Reference 36, between 1898 and 1925 (Ref. 36, p. 10). The Coberly property is located adjacent and west of the Former United Zinc #1 property, on the northeast corner of Kentucky Street and East Street (Highway 54). It is the location of the former United Iron Works Company, which operated from approximately 1906 to 1924 and in 1906 was noted as operating a steel foundry and iron works facility (Ref. 8, pp. 5, 11, 12). Smelting operations occurred at the IMP Boats property, depicted on page 11 of Reference 37, between 1896 and 1918 (Ref. 37, pp. 11-12).

Past U.S. Environmental Protection Agency (EPA) and Kansas Department of Health and Environment (KDHE) investigations have identified elevated levels of lead at former smelter facilities that operated on the Former United Zinc #1 property and in the surrounding residential, commercial, and school properties (Ref. 40, p. 4-6). The primary Former United Zinc #1 facility itself is located on the east side of Iola within a mixture of residential and commercial properties (Figures 1 and 2 of this HRS documentation record; Ref. 35, pp. 9, 11, 12), in the southwest quarter of Section 25, Township 24 South, Range 18 East, north of Highway 54 and east of Kentucky Street. It is comprised of 10 parcels of land, equivalent to approximately 17 acres (Ref. 3; Ref. 12, pp. 6, 8-9, 25; Figure 1 of this HRS documentation record). The property has been graded, leveled, and developed since the former smelter operations ceased in the 1920s (Ref. 8, p. 5). Most of the property where the former smelter was located is vacant but includes the following businesses: Brenntag Southwest, Inc. (Chemical Distribution Company), a MFA Distributor, the Superflea Flea Market, Tucker's Flea Market, a portion of a concrete mixing facility, and some pastureland (Ref. 12, p. 6; Ref. 22, p. 5).

The Former United Zinc #1 property is bordered on the north by residential properties; on the east by the East Iola property (the location of the former Prime Western Smelting Company Works No. 3 and J.B. Kirk Gas and Smelting Company; Ref. 36, p. 10), a car wash, a former Tyson processing facility, and a movie theater; on the south by a restaurant, a dry cleaner, a car dealership, and agricultural land; and on the west by the Coberly property (the location of the former United Iron Works Company and former Iola Brick Company #1 plant), a truck repair facility, and the remaining portion of the concrete mixing facility

(Ref. 8, pp. 11, 12; 12, pp. 6,7). The Former United Zinc #1 property is also surrounded by residential neighborhoods and two schools (Ref. 22, p. 5). A preschool is located northeast and an elementary school is located southwest of the property (Ref. 23, p. 2). The facility layout is shown in Figure 2 of the Site Inspection Report (Ref. 4, p. 34).

Another former smelter operation within Iola was located on the IMP Boats property, consisting of approximately 40 acres in the northeast quarter of the southeast quarter of Section 27, Township 24 South, Range 18 East, extending to the north into the southeast quarter of the northeast quarter (Ref. 37, p. 10; Ref. 42, p. 4). In 1896, the sons of Robert Lanyon constructed the original Lanyon #1 and Lanyon #2 smelters on the IMP Boats property, which were the first smelters in the Iola area, which later became a part of the largest zinc smelting company in the United States (Ref. 42, p. 5). Although zinc was the primary metal processed, lead and other metals were also processed at the smelter. Past research has revealed that American Metals Company (AMC) leased Lanyon #1 and 2 smelters from 1910 to an unknown date. AMC was later known as AMAX, Cyprus AMAX, and Phelps Dodge Corporation. J.B. Kirk Gas and Smelting Company and the U.S. Smelting Company also operated on the IMP Boats property. The smelter became inactive in the 1920s, and the property was divided and sold into several parcels. IMP Boats operated a boat manufacturing facility on the northern portion of the property until 1992 (Ref. 42, p. 5).

The extent of the site generally encompasses the areas of contamination depicted in Figures 1 and 2 of this HRS documentation record, including denoted slag piles remaining on the Former United Zinc #1 facility and excluding any areas that are currently known to be uncontaminated or are being addressed by other regulatory programs (Ref. 9, pp. 9, 12, 17, 18, 27; 34, pp. 3-5).

The driving factor for the HRS site score are residential targets associated with properties subject to actual lead contamination; according to the HRS Rule, Section 5.1.3, residential targets include a person living or attending school or day care on a property with an area of observed contamination and whose residence, school or day care center, respectively, is on or within 200 feet of the area of observed contamination (Ref. 1, Section 5.1.3). Although arsenic was detected widely in past investigations, its inclusion did not affect the site listing decision. Therefore, arsenic was not used for scoring purposes.

Previous Investigations

Lead soil contamination identified in and around the city of Iola was initially identified during investigations conducted at the Former United Zinc #1 facility, as documented in this section of the HRS documentation record. Further investigation into the possible sources of lead soil contamination identified other smelters in the area of the city of Iola, including but not limited to, former smelters on the East Iola, Coberly and IMP Boats properties (Ref. 8, pp. 11, 12; 12, pp. 7, 8, 24; 36, pp. 9-10; 37, pp. 10-12). A summary to these investigations is provided in this section.

A Phase I Focused Former Smelter Assessment (FFSA) was completed on behalf of the KDHE State Water Plan (SWP) program in December 2003. The FFSA identified a Recognized Environmental Condition (REC) at the Former United Zinc #1 facility based on observations of smelter waste during the site reconnaissance. The smelter waste appeared to have impacted the vegetative growth in the area of the former smelter operations of the Former United Zinc #1 facility. In addition, elevated concentrations of lead had been previously documented in the surface soils on the properties immediately adjacent to the facility from other documented smelting operations, including the East Iola and the Coberly properties. Additionally, it was noted that smelter wastes from the Former United Zinc #1 facility were identified on the Coberly property. A Phase II Assessment was recommended at the facility and in the area surrounding the smelting activities to investigate the potential risk of human exposure to heavy metal-impacted waste and surface soil (Ref. 8, pp. 1, 4, 16-17, 21, 22).

Sampling of the soil, smelter waste, ground water, surface water and sediment was conducted during the Phase II FFSA of the Former United Zinc #1 facility in 2004 on behalf of the KDHE. It indicated that surface and shallow subsurface soils were contaminated with arsenic and lead. Field screening results obtained using an X-Ray Fluorescence (XRF) spectrometer indicated surface soil were above KDHE Risk-Based Standards for Kansas (RSK) for arsenic in 18 out of 34 unbiased surface soil sample locations with concentrations ranging from 9 milligrams per kilogram (mg/kg) to 1,679 mg/kg. Lead concentrations exceeded KDHE RSK for lead in 30 unbiased surface soil sample locations with concentrations ranging from 412 mg/kg to 30,285 mg/kg. The report recommended further sampling to delineate the horizontal and vertical extent of heavy metal contamination at the facility property. The Phase II FFSA also indicated potential heavy metal contamination (e.g., arsenic, cadmium, lead) at both the McKinley School and the Iola Preschool (Ref. 9, pp. 7, 10, 14, 20-22).

On behalf of KDHE, soil samples were collected in May and June 2005 from 50 residential yards located between the Former United Zinc #1 facility and the McKinley School and the Iola Preschool. Arsenic was detected above the KDHE RSK level of 11 mg/kg in 18 of the residential samples. In addition, lead was found above its KDHE RSK level of 400 mg/kg in 18 of the residential samples. Cadmium and zinc were detected in all of the soil samples at concentrations below their KDHE RSK values (Ref. 23, pp. 2-4).

A Preliminary Removal Site Evaluation (RSE) report was completed by the KDHE in September 2005. In support of the 2005 RSE, KDHE collected additional samples from sensitive target areas near the Former United Zinc #1 smelter facility, including the McKinley Elementary School and Iola Preschool. The results exhibited elevated levels of arsenic, cadmium, lead, and zinc at residential and non-residential properties. The presence of lead above 400 mg/kg was also identified within the McKinley School playground and adjacent areas. The Preliminary RSE recommended further removal site evaluation and removal action consideration (Ref. 22, pp. 1, 5, 7-9).

An EPA directed RSE report was completed in September 2006. The sampling activities for the RSE were conducted during April and May 2006. During the RSE, approximately 260 properties were screened for lead using an XRF, and approximately 10 percent of the screened samples were submitted for laboratory confirmation analyses for arsenic, cadmium, lead, and zinc. Thirty-four properties were identified where either the XRF and/or laboratory data indicated lead concentrations warranting a time-critical removal action (400 mg/kg for schools and daycares; 800 mg/kg for residential properties; and 1,000 mg/kg for commercial properties). The 34 properties included 19 private residences, 10 daycare facilities, two elementary schools, and three commercial properties. In addition, 91 residential properties contained concentrations of lead between 400 mg/kg and 800 mg/kg (Ref.4, p. 8; 24, pp. 1, 7 - 13).

In February 2007, a Preliminary Assessment (PA) report was completed. It summarized the sampling activities conducted at the Former United Zinc #1 smelter facility property from August to November 2006. During the PA activities, approximately 500 residential properties were screened for lead using an XRF and 180 soil samples were submitted for laboratory confirmatory analyses of arsenic and lead. The laboratory results found arsenic detected in 160 of the confirmatory soil samples at concentrations exceeding the HRS Cancer Risk (CR) screening concentration of 0.43 mg/kg. In addition, 32 samples associated with the PA had concentrations that exceeded the HRS non-cancer screening concentration of 23 mg/kg for arsenic (Ref. 2, pp. 2, 3; 4, pp. 8-9; 12, pp. 1-2, 5, 11-12). However, arsenic was not used for scoring purposes, because its inclusion did not affect the site listing decision. In response to the finding of elevated concentrations of lead, the EPA began a removal site evaluation of properties in the area of Iola (Ref. 41, p. 1).

The Residential Soil Pathway for lead value of 400 mg/kg is found in the June 2007 KDHE Risk-Based Standards (Ref. 25, pp. 6, 8, 34). A total of 148 soil samples analyzed by the laboratory during the PA contained lead concentrations exceeding the KDHE RSK Residential Soil Pathway value of 400 mg/kg. All of these samples also exceeded lead background concentrations defined during the PA that ranged from 176 mg/kg to 397 mg/kg; however, the high concentrations of lead were determined not to be representative of site specific background conditions and appeared to have been affected by the operational history of the Former United Zinc #1 smelter facility. True background samples were collected during the CERCLA site inspection (SI) stage of the investigation, when utmost considerations were taken to ensure sampling points were located outside of the area impacted by activities attributed to the former smelter (Ref. 4, pp. 5, 9, 15-17).

The sampling plans for the EPA tasked RSE, PA and SI were designed in accordance with U.S. Environmental Protection Agency (U.S. EPA) guidance for data quality objectives to ensure that the sampling would be cost-effective (Ref. 6, pp. 1, 4-10; 7, pp. 1, 5-9).

Although arsenic and lead were found at significantly elevated levels in past investigations, only lead has been evaluated for scoring purposes in this HRS documentation record. An umbrella area of observed contamination (AOC) of lead, composed of individual, discrete areas of observed contamination, was documented by the chemical analysis of soil samples collected from the sampling area during the 2006 and 2007 sampling events; please see tables in Section 5.1.1 of this HRS documentation record for particular references. Associated field sheets are presented in Appendices D and H of Reference 40.

5.0 SOIL EXPOSURE PATHWAY

5.0.1 GENERAL CONSIDERATIONS

According to the HRS, the soil exposure pathway evaluation is based on areas of observed contamination (Ref. 1, Sect 5.0.1). The individual areas of observed soil contamination at the site were based on analytical evidence of hazardous substances present in concentrations three times or greater than the designated background levels and in concentrations greater than the corresponding sample quantitation limits (SQLs) (all surface soil samples were collected at a depth of 2 feet of less). The umbrella area of observed soil contamination is currently defined based on analytical results for soil samples collected in the area during the Preliminary Assessment (PA), Site Inspection (SI), and removal site evaluation field activities.

BACKGROUND LEVEL

Additional sampling characterization and delineation of the site indicated that sampling locations considered as background during the PA were later determined to be largely contiguous extensions of areas impacted by historical and operational activities at the site; the purpose of collection of these additional soil samples during the SI was to partly identify site-specific background concentrations of lead (Ref. 4, pp. 9, 16-17).

In support of the 2007 SI, five soil samples (presented in the table this section) were collected from five residential properties 1.25 miles north of the Former United Zinc #1 facility. These sample locations are located more than a mile away from the former smelter and, as depicted in Figures 2 and 3 of the 2007 SI. Visual inspection of the aerial photographs indicates that background locations are from a subdivision outside of the town center (Ref. 4, pp. 16, 35, 36); however, background and release samples were collected from the soil type Kenoma-Woodson-Dennis. Soils of the Kenoma-Woodson-Dennis soil type occupy approximately 37 percent of the county (Ref. 26, pp. 6, 7, 8). The sampling plan prepared in February 2007 established a methodology for collecting background samples; EPA standard operating

procedure (SOP) 4231.2012 was used to collect both release and background samples (Ref. 6, pp. 8, 17-18; Ref. 7, pp. 9, 12-13). Surface soil samples were collected and screened in the field at five residential properties to determine the site-specific background concentrations. At each property, after receiving consent from the owner, samples were collected from 0 to 2 inches below ground surface (Ref. 6, pp. 17-18; 4, pp. 4, 61-62). Lead concentrations in the background samples ranged from 21 to 122 mg/kg. The highest lead concentration of 122 mg/kg was found in sample 3396-2 (Ref. 4, pp. 39, 60, 66, 68, 74). The lead concentration level of 122 mg/kg was selected for use as the background level for the area, as it was the highest of the concentration levels. The background and release samples were collected from a similar depth, using the same sampling protocol, and analyzed using the same analytical method (Ref. 4, pp. 15-17, 61-62, 66-67, 77-81; 6, pp. 2, 8-10, 17-18; 7, pp. 5-6, 9, 12-14; 40, pp. 4-9, Appendix G).

TABLE 1: Background Samples

Sample ID	Sample Medium	Sampling Depth (inches below surface)	Date	Hazardous Substance	Concentration (mg/kg)	Sample Quantitation Limit (mg/kg)	References
3396-1	Soil	0-2	03/19/07	Lead	41.7	1.18	4, pp. 38, 60, 66, 68, 74, 77; 6, p. 8; Figure 2
3396-2	Soil	0-2	03/19/07	Lead	122	1.24	4, pp. 39, 60, 66, 68, 74, 78; 6, p. 8; Figure 2
3396-3	Soil	0-2	03/19/07	Lead	25.3	1.12	4, pp. 40, 60, 66, 68, 74, 79; 6, p. 8; Figure 2
3396-4	Soil	0-2	03/19/07	Lead	21.0	1.11	4, pp. 41, 60, 66, 68, 74, 80; 6, p. 8; Figure 2
3396-5	Soil	0-2	03/19/07	Lead	52.0	1.19	4, pp. 42, 60, 66, 69, 74, 81; 6, p. 8; Figure 2

Notes:

ID Identification
mg/kg Milligrams per kilogram

AREA OF CONTAMINATION

The EPA is not inferring contamination between sample locations meeting observed contamination criteria, due to the length of time since the former smelter operations were active (approximately 1925) and human development activities. Therefore, an umbrella area of observed contamination comprised of discrete, individual sample locations documenting areas of observed contamination was delineated based on analytical results for surface soil samples collected from residential and school yards. Only qualifying soil samples with lead concentrations greater than or equal to 366 mg/kg (three times the highest background concentration level of 122 mg/kg), were considered to be contaminated, meeting observed contamination criteria as defined by the Hazard Ranking System (HRS) (Ref. 1, Sections 2.3 and 5.0.1). However, all contaminated areas will be further investigated after placement of the site on the National Priorities List (Ref. 41, p. 1). Figure 2 depicts the areas of observed contamination associated with the site.

Contaminated Samples

For scoring purposes, only contaminated samples obtained from residential yards during the EPA removal and assessment sampling events were considered. The samples were collected from depths of 0 to 2 inches bgs (Ref. 6, pp. 8, 17; 7, pp. 9, 12-13). Soils at background and contaminated sample locations are classified as Kenoma-Woodson-Dennis. (Ref. 26, pp. 6, 7, 8; Figure 2 of this HRS documentation record). The background and release samples were collected from a similar depth, using the same sampling protocol, and analyzed using the same analytical method (Ref. 4, pp. 15-17, 61-62, 66-67, 77-81; 6, pp. 2, 8-10, 17-18; 7, pp. 5-6, 9, 12-14; 40, pp. 4-9, Appendix G).

Attribution

The results of sampling events conducted at the Former United Zinc & Associated Smelters site in 2006 and 2007 revealed concentrations of lead in residential and school yards (soils) at greater than or equal to 366 mg/kg; they are listed in Section 5.1.1 below. After referring to these individual areas of observed contamination, the EPA has determined that there is insufficient data available to identify the contribution from any individual former smelting facility to the soil contamination present in any particular location within the umbrella area of observed contamination. Therefore, a commingled area of soil contamination has been identified at this site, which includes the releases from the former smelters that operated in and around Iola, Kansas as possible origins of the lead soil contamination. The presence of lead within the umbrella area of observed contamination may be due to emissions from the smelter smokestacks or use of smelter waste as fill material. Cinders from the smelters that operated in and around Iola were used by the city as a road base in 1907 and in 1916, wastes (e.g., cinders) were used as roadbed materials for railroads (Ref. 8, p. 17; Ref. 10, p. 5). Zinc smelter waste is known to contain elevated concentrations of heavy metals from smelting activities—including arsenic and lead (Ref. 10, pp. 5-6).

As the area surrounding the site was part of the Tri-State Mining District, in the late 1870s the zinc smelting industry became an integral part of southeastern Kansas. The Tri-State District lies in southwestern Missouri, southeastern Kansas, and northeastern Oklahoma. For nearly 50 years, it was the world's leading producer of lead and zinc ores (Ref. 10, p. 1). In the early 1900s, led by Robert Lanyon multiple smelters were operated in Iola and the neighboring cities of La Harpe and Gas (Ref. 10, p. 7). Based on the history of smelters documented by KDHE, there were five smelters at four facilities operating in and around Iola, Kansas. They included Lanyon Works # 1 and # 2 (IMP Boats) located in the western portion of the city; East Iola, Coberly, Hiser Implement, and Former United Zinc # 1 clustered closely on the eastern edge of the city of Iola, immediately north of Highway 54 (Ref. 8, pp. 5, 11-12; Ref. 10, pp. 12).

The East Iola smelter was the former location of the Prime Western Smelting Company Works #3 and J.B. Kirk Gas and Smelting Company, a zinc smelter plant which operated from approximately 1899 until 1925 (Ref. 8, pp. 5, 11). The East Iola smelter was located in Iola, north of Highway 54 and west of Highway 169 (Ref. 8, p. 11). In 1910 it was noted that this facility contained 10 zinc furnaces and 3,240 retorts (Ref. 36, pp. 10, 22). In 1994 smelter wastes were observed at the location of the East Iola smelter. Soil samples collected from the East Iola smelter property in 1994 and 1998 contained lead at concentrations greater than 400 mg/kg (Ref. 8, p. 16). The Coberly property is the former location of the United Iron Works Company which operated from approximately 1906 to 1924 and in 1906 was noted as operating a steel foundry and iron works facility (Ref. 8, pp. 5, 11, 12). In 1992 a soil sample collected from the Coberly property showed lead at 47,000 mg/kg. Slag material containing lead up to 21,167 mg/kg has been observed on the Coberly smelter property (Ref. 8, p. 17).

According to the historic plat maps and fire insurance maps, activities at the Former United Zinc #1 Smelter property began as early as 1901. At that time, the Former United Zinc #1 facility was the location of the Standard Acid Company and included three furnaces, 12 retorts, and a pottery room with kilns. Mr. William Lanyon owned the property between 1901 and 1902. The property was transferred to United Zinc in 1902. The United Zinc and Chemical Company owned and operated the primary zinc smelter at this location until approximately 1912. No known active smelting facilities were documented on the property after 1912. Historical documentation indicates that the facility contained four furnaces, eight kilns, 14 retorts and several ore crushers and roasters (Ref. 22, pp. 5, 6; 35, pp. 1, 9). This facility was designed to capture the sulfur dioxide fumes generated during roasting of the ore to make sulfuric acid (Ref. 10, p. 5; 12, p. 7).

The IMP Boats property is located at 500 West Lincoln Road, Iola, Kansas 66749. The property included a large vacant lot that contains most of the smelter waste (Ref. 42, p. 4). In 1896 the sons of Robert Lanyon constructed the original Lanyon #1 and Lanyon #2 smelters on the IMP Boats property, which were the first smelters in the Iola area. American Metals Company leased Lanyon #1 and #2 smelters beginning in 1910. Subsequent operators also included J.B. Kirk Gas and Smelting Company and the United States Smelting Company. The smelters were inactive in the 1920s, and the property was divided and sold into several parcels. In 1991 lead was detected at 42,800 mg/kg during a Phase II in a soil sample collected from the smelter property. In September 1993 during a screening site inspection completed for EPA, lead was detected at a maximum of 23,800 mg/kg in soil samples collected from the smelter property (Ref. 42, p. 5). Other investigations conducted in 1993 and 1997 also identified high concentrations of lead in the soil of the IMP Boats property (Ref. 42, p. 6).

The site contamination is likely a result of a combination of air deposition and physical transfer of contaminated soils or dust from the Former United Zinc & Associated Smelters operations. This conclusion is based on the following:

(1) the operational history of the former smelters identified above;

(2) the presence of highly contaminated soils at the Former United Zinc #1 facility (and extension into nearby properties-see Figure 2 of this HRS documentation record) and the Lanyon #1 and #2 smelter properties (IMP Boats property); and

(3) possibly the height of the smokestacks present at each historical smelting facility, which may have caused atmospheric releases of contaminants to be dispersed over a larger area (Ref. 10, p. 5).

The uneven spatial distribution of lead concentrations at the site is likely due to the length of time since contaminant deposition and the variability in deposition areas due to variable wind directions. In the eight plus decades since operations ceased at the site, many of the residential yards in the area have been

disturbed by landscaping, sidewalk placement, gardening, and even total redevelopment. Further, the state of Kansas climatologist was contacted to request current and historical wind data around the site for 5-year periods between 1901 and 1905; between 1951 and 1955; and between 2007 and 2011 to view wind speed and direction distribution. The historical wind direction shows significant variability for Allen County, Kansas. For example, during the 1901-1905 time period, the wind direction was predominantly moving in a northeastern direction. While the predominant wind direction appeared to be from the south/southwest in the time period between 1951-1955 and 2007 - 2011, the data showed the wind traveled to and from all directions; the most recent wind rose data plots for the vicinity of the site are presented in pages 42 and 44 of Reference 33 (Ref. 31, p. 1; 33, p. 1-45). This data further supports the aerial deposition of lead contamination to the soil within the umbrella area of observed contamination, which cannot be attributed to any particular smelter.

5.1 RESIDENT POPULATION THREAT

5.1.1 Likelihood of Exposure

Individual, discrete areas of observed contamination were delineated based on analysis of surface soil samples collected from residential and school yards and within 200 feet of residences or school buildings. All soil samples with lead concentrations greater than or equal to 366 mg/kg were considered to be contaminated, meeting observed contamination criteria as defined by the Hazard Ranking System (HRS) Final Rule (Ref. 1, Sections 2.3 and 5.0.1). Residential property boundaries and sample locations were plotted in the residential field screening forms (see Reference 40 pages 5, 7 and Appendix H) and also recorded with global positioning system coordinates during sampling events. As per the sampling methodology and evidenced by property screening forms (referenced for each sampling location in the table below), all the residential and school properties where contaminated samples were collected and included for scoring purposes are less than 200 feet from the dwelling or school building (Ref. 4, pp. 76-81; 12, pp. 27-85; 7, pp. 12-14; 40, pp. 7-8, Appendix H). Therefore, all properties whose soil sample analytical results indicate lead contamination significantly above the background level have residents or students less than 200 feet from areas of observed contamination. Thus, a likelihood of exposure factor category value of 550 was assigned in accordance with the Hazard Ranking System (HRS) Rule (Ref. 1, Section 5.1.1, p. 51646).

The samples listed below, and shown in Figure 2 of this HRS documentation record, meet the requirements for establishing observed contamination.

TABLE 2: Area of Observed Contamination Samples

Sample Number	EPA Property ID	Date and Depth[2]	Lead Result (mg/kg)	Sample Quantitation Limit (mg/kg)[3]	References[1, 4]
3285-008	2	June 2007 (lab analyzed sample on 07/13/2007)	1,180	5.5	40, pp. 516, 519, 525; 52, p. 2
3152-006	3	8/16/2006	838 (collected at 12 inches below ground surface)	1.07	40, pp. 378, 381, 549-550; 53, p. 1; 18, pp. 1-2
3001-012	12	4/13/2006	806	5.31	24, pp. 34-35, 476, 482; 43, p. 3
3001-014	14	4/14/2006	539	5.14	24, pp. 37-38, 476, 483; 43, p. 3
3001-021	16	4/20/2006	745	6.90	24, pp. 40, 476, 485; 43, p. 5
3001-022	29	4/20/2006	571	5.16	24, pp. 56, 476, 485; 43, p. 5
3001-023	30	4/20/2006	681	5.10	24, pp. 57, 476, 485; 43, p. 5
3001-020	35	4/20/2006	582	5.51	24, pp. 62, 476, 484; 43, p. 4-5
3001-017	37	4/19/2006	434	5.53	24, pp. 64, 476, 484; 43, p. 4
3001-019	39	4/19/2006	440	5.31	24, pp. 66, 476, 484; 43, p. 4
3001-016	42	4/19/2006	420	5.19	24, pp. 69, 476, 483; 43, p. 4
3152-009	49	8/24/2006	400 (collected at 12 inches below ground surface)	1.09	40, pp. 378, 382, 565-566; 18, p. 2
3001-024	50	4/21/2006	567	5.95	24, pp. 77, 476, 485; 43, p. 5
3001-026	58	4/24/2006	769	6.64	24, pp. 90, 476, 486; 43, p. 6
3281-004	723	3/5/2007	761	1.05	40, pp. 489, 491, 1340; 48, p. 1
3001-029	80	4/25/2006	490	6.86	24, pp. 117-118, 476, 487; 43, p. 6
3001-035	89	4/27/2006	417	6.09	24, pp. 131, 476, 488; 43, p. 7
3001-037	107	5/2/2006	616	6.76	24, pp. 154-155, 476, 489; 43, p. 8
3001-048	179	5/8/2006	411	7.16	24, pp. 291, 477, 491;

Sample Number	EPA Property ID	Date and Depth[2]	Lead Result (mg/kg)	Sample Quantitation Limit (mg/kg)[3]	References[1, 4]
					43, p. 10
3001-050	185	5/10/2006	397	6.12	24, pp. 297, 477, 492; 43, p. 10
3001-054	197	5/11/2006	504	6.25	24, pp. 309, 477, 493; 43, p. 11
3001-052	198	5/10/2006	562	6.64	24, pp. 310, 477, 492; 43, p. 11
3001-051	201	5/10/2006	764	6.99	24, pp. 313, 477, 492; 43, p. 10-11
3001-056	216	5/15/2006	496	6.58	24, pp. 329, 477, 493; 43, p. 11-12
3001-057	218	5/15/2006	494	5.91	24, pp. 331, 477, 494; 43, p. 12
3001-059	221	5/15/2006	614	6.19	24, pp. 335, 477, 494; 43, p. 12
3001-062	225	5/16/2006	551	5.78	24, pp. 339, 477, 495; 43, p. 13
3001-067	236	5/17/2006	509	5.79	24, pp. 350, 477, 496; 43, p. 14
3001-066	239	5/17/2006	386	6.25	24, pp. 353, 477, 496; 43, p. 13
3001-069	243	5/17/2006	460	5.44	24, pp. 359, 477, 497; 43, p. 14
3001-070	244	5/17/2006	554	5.67	24, pp. 360-361, 477, 497; 43, p. 14
3001-068	248	5/17/2006	628	5.58	24, pp. 365, 477, 496; 43, p. 14
3001-073	249	5/18/2006	585	6.14	24, pp. 366, 477, 498; 43, p. 15
3151-006	261	8/9/2006	805	5.54	40, pp. 370, 373, 823; 17, p. 2
3151-010	262	8/9/2006	396	5.42	40, pp. 370, 374, 824; 17, p. 2-3
3151-009	268	8/9/2006	647	5.16	40, pp. 370, 374, 830; 17, p. 2
3151-001	270	8/15/2006	552	6.23	40, pp. 370, 372, 832; 17, p. 1
3152-011	281	8/28/2006	541	1.20	40, pp. 378, 382, 615-616; 18, p. 2
3152-002	285	8/21/2006	991	1.26	40, pp. 378, 380, 845; 18, p. 1
3152-010	287	8/25/2006	518	1.14	40, pp. 378, 382, 847; 18, p. 2

Sample Number	EPA Property ID	Date and Depth[2]	Lead Result (mg/kg)	Sample Quantitation Limit (mg/kg)[3]	References[1, 4]
3152-016	294	8/30/2006	996	1.20	40, pp. 378, 383, 855; 18, p. 3
3152-003	298	8/22/2006	782	1.25	40, pp. 378, 380, 857; 18, p. 1
3152-008	299	8/24/2006	1,130	1.12	40, pp. 378, 381, 858; 18, p. 2
3152-020	315	8/31/2006	600	1.16	40, pp. 378, 384, 872; 18, pp. 3-4
3152-014	325	8/30/2006	1,010	1.27	40, pp. 378, 383, 883; 18, p. 3
3152-015	326	8/30/2006	582	1.25	40, pp. 378, 383, 884-885; 18, p. 3
3152-012	328	8/29/2006	1,050	1.32	40, pp. 378, 382, 886; 18, p. 2
3153-005	333	9/11/2006	566	5.21	40, pp. 388, 391, 891-892; 19, p. 2
3152-013	334	8/29/2006	1,050	1.20	40, pp. 378, 383, 893; 18, pp. 2-3
3153-007	344	9/12/2006	504	5.40	40, pp. 388, 391, 905-906; 19, p. 2
3153-008	346	9/12/2006	420	5.40	40, pp. 388, 392, 908; 19, p. 2; 19, p. 2
3153-012	354	9/13/2006	406	5.69	40, pp. 388, 392, 918-919; 19, p. 3
3153-010	356	9/12/2006	484	5.39	40, pp. 388, 392, 922-923; 19, pp. 2-3
3153-001	373	9/6/2006	412	5.60	40, pp. 388, 390, 944; 19, p. 1
3154-023	387	9/26/2006	461	1.14	40, pp. 398, 405, 959; 20, p. 4
3153-004	392	9/11/2006	460	5.41	40, pp. 388, 390, 966; 19, p. 1
3153-014	394	9/14/2006	523	5.06	40, pp. 388, 393, 968; 19, p. 3
3154-004	396	9/19/2006	509	1.22	40, pp. 398, 400, 970-971; 20, p. 1
3156-022	400	10/19/2006	1,360	6.68	40, pp. 426, 434, 976-977; 14, p. 5
3154-016	404	9/21/2006	748	1.24	40, pp. 398, 403, 980; 20, p. 3
3154-018	406	9/21/2006	449	1.17	40, pp. 398, 404, 982-983; 20, p. 3
3154-002	414	9/18/2006	593	1.14	40, pp. 398, 400, 991;

Sample Number	EPA Property ID	Date and Depth[2]	Lead Result (mg/kg)	Sample Quantitation Limit (mg/kg)[3]	References[1, 4]
					20, p. 1
3154-019	431	9/25/2006	380	1.21	40, pp. 398, 404, 1015; 20, p. 3
3154-017	433	9/21/2006	719	1.22	40, pp. 398, 404, 1018; 20, p. 3
3154-014	434	9/21/2006	916	1.21	40, pp. 398, 403, 1019; 20, p. 3
3156-027	446	10/20/2006	921	5.41	40, pp. 426, 435, 1034; 14, p. 6
3154-015	463	9/21/2006	1,140	1.17	40, pp. 398, 403, 1053; 20, p. 3
3154-034	468	9/28/2006	1,010	1.14	40, pp. 398, 408, 1060; 20, p. 5-6
3157-003	480	10/31/2006	824	6.47	40, pp. 442, 444, 1071; 15, p. 1
3156-035	500	10/25/2006	503	5.89	40, pp. 427, 437, 1098; 14, p. 7
3157-014	505	11/6/2006	1,520	6.29	40, pp. 442, 447, 1103; 15, p. 3
3156-036	509	10/25/2060	374	5.98	40, pp. 427, 437, 1107; 14, p. 8
3155-004	514	10/3/2006	908	5.28	40, pp. 412, 414, 1112; 13, p. 1
3155-003	515	10/3/2006	683	4.95	40, pp. 412, 414, 1113; 13, p. 1
3157-002	526	10/30/2006	662	6.19	40, pp. 442, 444, 1126; 15, p. 1
3154-035	532	9/29/2006	1,920	1.16	40, pp. 398, 408, 1134; 20, p. 6
3154-008	541	9/25/2006	568	1.19	40, pp. 398, 401, 1144-1145; 20, p. 2
3157-004	544	10/31/2006	726	6.71	40, pp. 442, 444, 1149; 15, p. 1
3154-022	547	9/26/2006	581	1.18	40, pp. 398, 405, 1154; 20, p. 4
3155-016	553	10/6/2006	507	5.48	40, pp. 412, 417, 1160; 13, p. 4
3154-029	554	9/27/2006	916	1.13	40, pp. 398, 407, 1161; 20, p. 5
3154-006	558	9/25/2006	761	1.19	40, pp. 398, 401, 1164; 20, pp. 1-2
3154-028	567	9/27/2006	1,190	1.14	40, pp. 398, 406, 1174; 20, p. 5

Sample Number	EPA Property ID	Date and Depth[2]	Lead Result (mg/kg)	Sample Quantitation Limit (mg/kg)[3]	References[1, 4]
3154-033	591	9/28/2006	1,230	1.15	40, pp. 398, 408, 812; 20, p. 5
3154-032	593	9/28/2006	2,520	1.20	40, pp. 398, 407, 812; 20, p. 5
3285-002	606	5/30/2007	408	5.4	40, pp. 516, 518, 687-688; 52, p. 1
3155-008	610	10/4/2006	676	5.37	40, pp. 412, 415, 1220; 13, p. 2
3157-015	611	11/6/2006	3,980	6.17	40, pp. 442, 447, 1221-1222; 15, pp. 3-4
3155-005	625	10/4/2006	993	5.60	40, pp. 412, 415, 1234; 13, p. 2
3156-014	632	10/18/2006	746	5.89	40, pp. 426, 432, 1241; 14, p. 3
3156-013	647	10/18/2006	420	6.45	40, pp. 426, 432, 1258; 14, p. 3
3156-015	648	10/18/2006	1,360	6.13	40, pp. 426, 432, 813; 14, pp. 3-4
3155-010	659	10/5/2006	785	5.39	40, pp. 412, 416, 1270; 13, pp. 2-3
3157-016	668	11/7/2006	665	5.99	40, pp. 442, 447, 1277; 15, p. 4
3156-020	692	10/19/2006	1,470	5.85	40, pp. 426, 433, 1304-1305; 14, pp. 4-5
3155-031	694	10/12/2006	521	5.92	40, pp. 412, 421, 1307; 13, p. 7
3155-033	699	10/13/2006	794	5.64	40, pp. 412, 422; 13, p. 7
3155-030	703	10/12/2006	397	5.83	40, pp. 412, 421, 1318; 13, pp. 6-7
3155-019	710	10/10/2006	789	5.71	40, pp. 412, 418, 1326; 13, p. 4
3155-027	717	10/12/2006	764	6.23	40, pp. 412, 420, 1333; 13, p. 6
3156-001	729	10/16/2006	731	5.77	40, pp. 426, 429, 1348-1349; 14, p. 1
3155-026	725	10/12/2006	482	5.94	40, pp. 412, 420, 1341-1342; 13, p. 6
3156-004	739	10/16/2006	1,260	6.78	40, pp. 426, 429, 1361; 14, p. 1
3156-006	745	10/17/2006	374	5.91	40, pp. 426, 430,

Sample Number	EPA Property ID	Date and Depth[2]	Lead Result (mg/kg)	Sample Quantitation Limit (mg/kg)[3]	References[1, 4]
					1367; 14, p. 2
3156-007	746	10/17/2006	588	5.90	40, pp. 426, 430, 1368; 14, p. 2
3156-003	748	10/16/2006	458	6.84	40, pp. 426, 429, 1370; 14, p. 1
3156-025	750	10/19/2006	861	5.87	40, pp. 426, 435, 1373-1374; 14, pp. 5-6
3156-008	753	10/17/2006	680	6.16	40, pp. 426, 430, 1378; 14, p. 2
3156-028	764	10/23/2006	559	6.27	40, pp. 426, 435, 1390; 14, p. 6
3156-012	781	10/18/2006	515	6.23	40, pp. 426, 431, 1408; 14, p. 3
3156-034	786	10/25/2006	599	6.66	40, pp. 427, 437, 1415-1416; 14, p. 7
3156-033	787	10/24/2006	825	5.74	40, pp. 426, 437, 1417-1418; 14, p. 7
3156-024	793	10/20/2006	831	5.66	40, pp. 426, 434, 1424; 14, p. 5
3156-030	796	10/24/2006	1,050	5.75	40, pp. 426, 436, 1428; 14, pp. 6-7
3156-026	810	10/29/2006	774	5.79	40, pp. 426, 435, 1448-1449; 14, p. 6
3157-012	813	11/2/2006	950	6.00	40, pp. 442, 446, 1454-1455; 15, p. 3
3157-010	833	11/2/2006	674	6.30	40, pp. 442, 446, 1481-1482; 15, p. 3
3157-008	844	11/1/2006	748	6.47	40, pp. 442, 445, 1494; 15, p. 2
3156-037	853	10/26/2006	529	5.93	40, pp. 427, 438, 1505; 14, p. 8
3157-009	862	11/1/2006	505	6.19	40, pp. 442, 446, 1517-1518; 15, p. 2
3157-005	877	10/31/2006	542	6.82	40, pp. 442, 445, 1535; 15, p. 2
3157-007	883	11/1/2006	871	6.33	40, pp. 442, 445, 1545; 15, p. 2
3156-031	895	10/24/2006	396	5.60	40, pp. 426, 436, 1559; 14, p. 7
3157-017	907	11/8/2006	687	6.05	40, pp. 442, 448, 1577; 15, p. 4
3158-006	950	11/27/2006	526	6.43	40, pp. 452, 455,

Sample Number	EPA Property ID	Date and Depth[2]	Lead Result (mg/kg)	Sample Quantitation Limit (mg/kg)[3]	References[1, 4]
					1629-1630; 16, p. 2
3158-003	965	11/17/2006	426	6.03	40, pp. 452, 454, 1649; 16, p. 1
3158-008	968	11/27/2006	940	6.26	40, pp. 452, 455, 1653-1654; 16, p. 2
3158-004	982	11/21/2006	483	5.65	40, pp. 452, 454, 1675-1676; 16, p. 1
3280-023	992	3/1/2007	445	5.2	40, pp. 477, 484, 1687; 47, p. 5
3280-024	993	3/1/2007	838	5.4	40, pp. 477, 484, 1688; 47, p. 5
3158-011	998	11/29/2006	961	6.54	40, pp. 452, 456, 1694; 16, p. 3
3279-017	1002	1/11/2007	602	7.0	40, pp. 468, 474, 1698; 46, p. 4
3280-016	1007	2/22/2007	806	5.7	40, pp. 477, 482, 1707-1708; 47, p. 4
3281-001	1020	3/5/2007	459	1.07	40, pp. 489, 491, 1729; 48, p. 1
3159-001	1026	12/12/2006	692	7.12	40, pp. 460, 462, 1737; 44, p. 1
3159-003	1027	12/12/2006	851	7.17	40, pp. 460, 462, 1738; 44, p. 1
3159-009	1028	12/13/2006	606	6.13	40, pp. 460, 464, 1739; 44, p. 2
3159-010	1029	12/13/2006	1,020	6.32	40, pp. 460, 464, 1740; 44, pp. 2-3
3159-006	1034	12/12/2006	443	6.28	40, pp. 460, 463, 1747; 44, p. 2
3159-007	1036	12/12/2006	978	6.25	40, pp. 460, 463, 1749-1750; 44, p. 2
3159-014	1062	12/19/2006	904	6.37	40, pp. 460, 465, 815-816; 44, p. 3
3279-002	1068	1/4/2007	1,080	7.10	40, pp. 468, 470, 1788; 46, p. 1
3159-013	1074	12/18/2006	678	6.52	40, pp. 460, 465, 1794; 44, p. 3
3159-015	1083	12/19/2006	883	6.41	40, pp. 460, 465, 1807; 44, pp. 3-4
3280-012	1094	2/26/2007	880	5.4	40, pp. 477, 481, 1819-1820; 47, p. 3
3281-006	1109	3/5/2007	430	1.04	40, pp. 489, 492, 1838; 48, p. 1-2

Sample Number	EPA Property ID	Date and Depth[2]	Lead Result (mg/kg)	Sample Quantitation Limit (mg/kg)[3]	References[1, 4]
3280-021	1110	3/1/2007	605	5.2	40, pp. 477, 484, 1839; 47, p. 5
3281-008	1128	3/5/2007	489	1.04	40, pp. 489, 492, 1862-1863; 48, p. 2
3159-004	1139	12/12/2006	1,290	6.50	40, pp. 460, 462, 1877; 44, p. 1
3280-002	1160	2/21/2007	377	6.0	40, pp. 477, 479, 1897; 47, p. 1
3279-014	1181	1/11/2007	396	5.6	40, pp. 468, 473, 1922; 46, p. 3
3159-008	1190	12/14/2006	893	6.34	40, pp. 460, 463, 1937; 44, p. 2
3159-005	1214	12/12/2006	983	6.49	40, pp. 460, 463, 1962; 44, p. 2
3280-015	1219	2/22/2007	1,070	5.9	40, pp. 477, 482, 1967; 47, pp. 3-4
3159-012	1220	12/18/2006	519	5.77	40, pp. 460, 464, 1968; 44, p. 3
3281-017	1227	3/12/2007	528	1.15	40, pp. 489, 495, 1974-1975; 48, p. 3
3280-003	1243	2/21/2007	774	5.7	40, pp. 477, 479, 1997; 47, p. 1
3280-005	1250	2/22/2007	1,120	5.7	40, pp. 477, 480, 2005; 47, p. 2
3279-009	1252	1/10/2007	806	6.5	40, pp. 468, 472, 2006; 46, p. 2
3279-010	1256	1/10/2007	775	5.9	40, pp. 468, 472, 2012; 46, pp. 2-3
3280-029	1257	3/2/2007	528	6.0	40, pp. 477, 486, 2013; 47, p. 6
3279-012	1264	1/10/2007	451	6.6	40, pp. 468, 472, 2021; 46, p. 3
3280-011	1267	2/26/2007	837	5.4	40, pp. 477, 481, 2025; 47, p. 3
3279-016	1271	1/11/2007	496	6.5	40, pp. 468, 473, 2030-2031; 46, p. 4
3281-011	1284	3/6/2007	450	1.09	40, pp. 489, 493, 2044; 48, p. 2
3280-028	1287	3/1/2007	755	5.3	40, pp. 477, 485, 2047; 47, p. 6
3280-017	1293	2/23/2007	396	5.3	40, pp. 477, 483, 2051; 47, p. 4
3280-014	1299	2/26/2007	685	5.2	40, pp. 477, 482,

Sample Number	EPA Property ID	Date and Depth[2]	Lead Result (mg/kg)	Sample Quantitation Limit (mg/kg)[3]	References[1, 4]
					2054; 47, p. 3
3279-001	1312	1/4/2007	935	6.3	40, pp. 468, 470, 2070; 46, p. 1
3280-027	1319	3/1/2007	702	5.3	40, pp. 477, 485, 2081; 47, p. 6
3285-006	1320	6/7/2007	479	4.8	40, pp. 516, 519, 777-778; 52, p. 2
3281-009	1352	3/5/2007	481	1.10	40, pp. 489, 493, 2114; 48, p. 2
3280-025	1324	3/1/2007	998	5.2	40, pp. 477, 485, 2085; 47, pp. 5-6
3281-015	1389	3/6/2007	391	1.04	40, pp. 489, 494, 2160-2161; 48, p. 3
3279-013	1404	1/2/2007	378	6.4	40, pp. 468, 473, 2190-2191; 46, p. 3
3279-004	1406	1/8/2007	777	6.2	40, pp. 468, 470, 2194-2195; 46, p. 1
3279-005	1412	1/9/2007	744	6.0	40, pp. 468, 471, 2204-2205; 46, p. 2
3279-008	1419	1/10/2007	380	6.6	40, pp. 468, 471, 2211; 46, p. 2
3279-006	1434	1/9/2007	1,600	6.5	40, pp. 468, 471, 2233; 46, p. 2
3280-019	1440	2/23/2007	805	5.3	40, pp. 477, 483, 2242; 47, p. 4
3281-019	1445	3/13/2007	553	1.31	40, pp. 489, 495, 2248; 48, p. 3
3280-010	1456	2/26/2007	482	5.2	40, pp. 477, 481, 2258-2259; 47, pp. 2-3
3281-010	1462	3/5/2007	1,270	1.06	40, pp. 489, 493, 2265-2266; 48, p. 2
3281-007	1471	3/5/2007	953	1.05	40, pp. 489, 492, 2277-2278; 48, p. 2
3280-030	1478	3/2/2007	576	5.3	40, pp. 477, 486, 2285; 47, pp. 6-7
3281-003	1489	3/5/2007	592	1.04	40, pp. 489, 491, 2299-2300; 48, p. 1
3281-014	1496	3/6/2007	895	1.04	40, pp. 489, 494, 2309; 48, p. 3
3280-031	1553	3/2/2007	1,260	5.4	40, pp. 477, 486, 2382; 47, p. 7
3282-004	1589	4/2/2007	931	6.7	40, pp. 498, 500,

Sample Number	EPA Property ID	Date and Depth[2]	Lead Result (mg/kg)	Sample Quantitation Limit (mg/kg)[3]	References[1, 4]
					2431; 49, p. 1
3283-004	1593	4/23/2007	755	6.2	40, pp. 504, 506, 2436; 50, p. 1
3283-008	1631	4/26/2007	671	6.0	40, pp. 504, 507, 2485-2486; 50, p. 2
3285-003	1663	5/31/2007	613	6.3	40, pp. 516, 518, 2533-2534; 52, p. 1
3285-001	1672	5/29/2007	1,340	6.3	40, pp. 516, 518, 2549; 52, p. 1

Notes:

EPA U.S. Environmental Protection Agency
ID Identification
mg/kg Milligrams per kilogram

1. References for chains of custody (COCs) for Analytical Service Requests (ASR) that correspond with the first four digits of the sample identification number are as follows: ASR 3001 (Ref. 24, p. 453-458), ASR 3151 (Ref. 40, p. 37), ASR 3152 (Ref. 40, p. 50), ASR 3153 (Ref. 40, p. 71), ASR 3154 (Ref. 40, pp. 89-90), ASR 3155 (Ref. 40, pp. 126-127), ASR 3156 (Ref. 40, pp. 161-162), ASR 3157 (Ref. 40, pp. 200), ASR 3158 (Ref. 40, p. 219), ASR 3159 (Ref. 40, p. 231), ASR 3279 (Ref. 40, p. 247), ASR 3280 (Ref. 40, pp. 266-267), ASR 3281 (Ref. 40, p. 299), ASR 3282 (Ref. 40, p. 320), ASR 3283 (Ref. 40, p. 328), and ASR 3285 (Ref. 40, p. 345).
2. All samples were collected between 0 and 2 inches, unless otherwise noted (please refer to section 5.1.1 of this HRS documentation record).
3. The sample quantitation limit (SQL) is shown as the report limit (RL) in the HRS Analytical Results Supplement provided by the laboratory. The laboratory's reporting limit is adjusted for the dilution factor, volume adjustment, or percent solids for that sample analysis and is equivalent to a SQL (see page 1 of References 13 to 20, 43, 44, 46, 47, 48, 50, and 52).
4. The sampling dates and times, as well as the property cell where a sample was collected are documented in Reference 24, Appendix C and Attachment 1 respectively and Reference 40, Appendices D and G respectively for relevant samples.

TABLE 3: School and Residential Samples

Sample Number	Date Collected[3]	Distance of Population/Resources from Area of Observed Contamination (feet)[2]	Number of Resident Targets[1]	References
3285-008 (McKinley Elementary School)	June 2007 (lab analyzed sample on 07/13/2007)	<200	136 (students) 8 (teachers)[1]	39, pp. 1; 54, p. 1
3152-006 (Jefferson Elementary School)	8/16/2006	<200	253 (students) 16 (teachers)	39, pp. 1
3001-012	4/13/2006	<200	2.36	29, p. 1
3001-014	4/14/2006	<200	2.36	29, p. 1
3001-021	4/20/2006	<200	2.36	29, p. 1
3001-022	4/20/2006	<200	2.36	29, p. 1
3001-023	4/20/2006	<200	2.36	29, p. 1
3001-020	4/20/2006	<200	2.36	29, p. 1
3001-017	4/19/2006	<200	2.36	29, p. 1
3001-019	4/19/2006	<200	2.36	29, p. 1
3001-016	4/19/2006	<200	2.36	29, p. 1
3152-009	8/24/2006	<200	2.36	29, p. 1
3001-024	4/21/2006	<200	2.36	29, p. 1
3001-026	4/24/2006	<200	2.36	29, p. 1
3281-004	3/5/2007	<200	2.36	29, p. 1
3001-035	4/27/2006	<200	2.36	29, p. 1
3001-037	5/2/2006	<200	2.36	29, p. 1
3001-048	5/8/2006	<200	2.36	29, p. 1
3001-050	5/10/2006	<200	2.36	29, p. 1
3001-054	5/11/2006	<200	2.36	29, p. 1
3001-052	5/10/2006	<200	2.36	29, p. 1
3001-051	5/10/2006	<200	2.36	29, p. 1
3001-056	5/15/2006	<200	2.36	29, p. 1
3001-057	5/15/2006	<200	2.36	29, p. 1
3001-059	5/15/2006	<200	2.36	29, p. 1
3001-062	5/16/2006	<200	2.36	29, p. 1
3001-067	5/17/2006	<200	2.36	29, p. 1
3001-066	5/17/2006	<200	2.36	29, p. 1
3001-069	5/17/2006	<200	2.36	29, p. 1
3001-070	5/17/2006	<200	2.36	29, p. 1
3001-068	5/17/2006	<200	2.36	29, p. 1
3001-073	5/18/2006	<200	2.36	29, p. 1
3151-006	8/9/2006	<200	2.36	29, p. 1
3151-010	8/9/2006	<200	2.36	29, p. 1
3151-009	8/9/2006	<200	2.36	29, p. 1
3151-001	8/15/2006	<200	2.36	29, p. 1
3152-011	8/28/2006	<200	2.36	29, p. 1
3152-002	8/21/2006	<200	2.36	29, p. 1
3152-010	8/25/2006	<200	2.36	29, p. 1
3152-016	8/30/2006	<200	2.36	29, p. 1
3152-003	8/22/2006	<200	2.36	29, p. 1
3152-008	8/24/2006	<200	2.36	29, p. 1
3152-020	8/31/2006	<200	2.36	29, p. 1
3152-014	8/30/2006	<200	2.36	29, p. 1
3152-015	8/30/2006	<200	2.36	29, p. 1
3152-012	8/29/2006	<200	2.36	29, p. 1
3153-005	9/11/2006	<200	2.36	29, p. 1
3152-013	8/29/2006	<200	2.36	29, p. 1
3153-007	9/12/2006	<200	2.36	29, p. 1

Sample Number	Date Collected[3]	Distance of Population/Resources from Area of Observed Contamination (feet)[2]	Number of Resident Targets[1]	References
3153-008	9/12/2006	<200	2.36	29, p. 1
3153-012	9/13/2006	<200	2.36	29, p. 1
3153-010	9/12/2006	<200	2.36	29, p. 1
3153-001	9/6/2006	<200	2.36	29, p. 1
3154-023	9/26/2006	<200	2.36	29, p. 1
3153-004	9/11/2006	<200	2.36	29, p. 1
3153-014	9/14/2006	<200	2.36	29, p. 1
3154-004	9/19/2006	<200	2.36	29, p. 1
3156-022	10/19/2006	<200	2.36	29, p. 1
3154-016	9/21/2006	<200	2.36	29, p. 1
3154-018	9/21/2006	<200	2.36	29, p. 1
3154-002	9/18/2006	<200	2.36	29, p. 1
3154-019	9/25/2006	<200	2.36	29, p. 1
3154-017	9/21/2006	<200	2.36	29, p. 1
3154-014	9/21/2006	<200	2.36	29, p. 1
3156-027	10/20/2006	<200	2.36	29, p. 1
3154-015	9/21/2006	<200	2.36	29, p. 1
3154-034	9/28/2006	<200	2.36	29, p. 1
3157-003	10/31/2006	<200	2.36	29, p. 1
3156-035	10/25/2006	<200	2.36	29, p. 1
3157-014	11/6/2006	<200	2.36	29, p. 1
3156-036	10/25/2060	<200	2.36	29, p. 1
3155-004	10/3/2006	<200	2.36	29, p. 1
3155-003	10/3/2006	<200	2.36	29, p. 1
3157-002	10/30/2006	<200	2.36	29, p. 1
3154-035	9/29/2006	<200	2.36	29, p. 1
3154-008	9/25/2006	<200	2.36	29, p. 1
3157-004	10/31/2006	<200	2.36	29, p. 1
3154-022	9/26/2006	<200	2.36	29, p. 1
3155-016	10/6/2006	<200	2.36	29, p. 1
3154-029	9/27/2006	<200	2.36	29, p. 1
3154-006	9/25/2006	<200	2.36	29, p. 1
3154-028	9/27/2006	<200	2.36	29, p. 1
3154-033	9/28/2006	<200	2.36	29, p. 1
3154-032	9/28/2006	<200	2.36	29, p. 1
3285-002	5/30/2007	<200	2.36	29, p. 1
3155-008	10/4/2006	<200	2.36	29, p. 1
3157-015	11/6/2006	<200	2.36	29, p. 1
3155-005	10/4/2006	<200	2.36	29, p. 1
3156-014	10/18/2006	<200	2.36	29, p. 1
3156-013	10/18/2006	<200	2.36	29, p. 1
3156-015	10/18/2006	<200	2.36	29, p. 1
3155-010	10/5/2006	<200	2.36	29, p. 1
3157-016	11/7/2006	<200	2.36	29, p. 1
3156-020	10/19/2006	<200	2.36	29, p. 1
3155-031	10/12/2006	<200	2.36	29, p. 1
3155-033	10/13/2006	<200	2.36	29, p. 1
3155-030	10/12/2006	<200	2.36	29, p. 1
3155-019	10/10/2006	<200	2.36	29, p. 1
3155-027	10/12/2006	<200	2.36	29, p. 1
3156-001	10/16/2006	<200	2.36	29, p. 1
3155-026	10/12/2006	<200	2.36	29, p. 1
3156-004	10/16/2006	<200	2.36	29, p. 1
3156-006	10/17/2006	<200	2.36	29, p. 1
3156-007	10/17/2006	<200	2.36	29, p. 1

Sample Number	Date Collected[3]	Distance of Population/Resources from Area of Observed Contamination (feet)[2]	Number of Resident Targets[1]	References
3156-003	10/16/2006	<200	2.36	29, p. 1
3156-025	10/19/2006	<200	2.36	29, p. 1
3156-008	10/17/2006	<200	2.36	29, p. 1
3156-028	10/23/2006	<200	2.36	29, p. 1
3156-012	10/18/2006	<200	2.36	29, p. 1
3156-034	10/25/2006	<200	2.36	29, p. 1
3156-033	10/24/2006	<200	2.36	29, p. 1
3156-024	10/20/2006	<200	2.36	29, p. 1
3156-030	10/24/2006	<200	2.36	29, p. 1
3156-026	10/29/2006	<200	2.36	29, p. 1
3157-012	11/2/2006	<200	2.36	29, p. 1
3157-010	11/2/2006	<200	2.36	29, p. 1
3157-008	11/1/2006	<200	2.36	29, p. 1
3156-037	10/26/2006	<200	2.36	29, p. 1
3157-009	11/1/2006	<200	2.36	29, p. 1
3157-005	10/31/2006	<200	2.36	29, p. 1
3157-007	11/1/2006	<200	2.36	29, p. 1
3156-031	10/24/2006	<200	2.36	29, p. 1
3157-017	11/8/2006	<200	2.36	29, p. 1
3158-006	11/27/2006	<200	2.36	29, p. 1
3158-003	11/17/2006	<200	2.36	29, p. 1
3158-008	11/27/2006	<200	2.36	29, p. 1
3158-004	11/21/2006	<200	2.36	29, p. 1
3280-023	3/1/2007	<200	2.36	29, p. 1
3280-024	3/1/2007	<200	2.36	29, p. 1
3158-011	11/29/2006	<200	2.36	29, p. 1
3279-017	1/11/2007	<200	2.36	29, p. 1
3280-016	2/22/2007	<200	2.36	29, p. 1
3281-001	3/5/2007	<200	2.36	29, p. 1
3159-001	12/12/2006	<200	2.36	29, p. 1
3159-003	12/12/2006	<200	2.36	29, p. 1
3159-009	12/13/2006	<200	2.36	29, p. 1
3159-010	12/13/2006	<200	2.36	29, p. 1
3159-006	12/12/2006	<200	2.36	29, p. 1
3159-007	12/12/2006	<200	2.36	29, p. 1
3159-014	12/19/2006	<200	2.36	29, p. 1
3279-002	1/4/2007	<200	2.36	29, p. 1
3159-013	12/18/2006	<200	2.36	29, p. 1
3159-015	12/19/2006	<200	2.36	29, p. 1
3280-012	2/26/2007	<200	2.36	29, p. 1
3281-006	3/5/2007	<200	2.36	29, p. 1
3280-021	3/1/2007	<200	2.36	29, p. 1
3281-008	3/5/2007	<200	2.36	29, p. 1
3159-004	12/12/2006	<200	2.36	29, p. 1
3280-002	2/21/2007	<200	2.36	29, p. 1
3279-014	1/11/2007	<200	2.36	29, p. 1
3159-008	12/14/2006	<200	2.36	29, p. 1
3159-005	12/12/2006	<200	2.36	29, p. 1
3280-015	2/22/2007	<200	2.36	29, p. 1
3159-012	12/18/2006	<200	2.36	29, p. 1
3280-003	2/21/2007	<200	2.36	29, p. 1
3280-005	2/22/2007	<200	2.36	29, p. 1
3279-009	1/10/2007	<200	2.36	29, p. 1
3279-010	1/10/2007	<200	2.36	29, p. 1
3280-029	3/2/2007	<200	2.36	29, p. 1

Sample Number	Date Collected[3]	Distance of Population/Resources from Area of Observed Contamination (feet)[2]	Number of Resident Targets[1]	References
3279-012	1/10/2007	<200	2.36	29, p. 1
3280-011	2/26/2007	<200	2.36	29, p. 1
3279-016	1/11/2007	<200	2.36	29, p. 1
3281-011	3/6/2007	<200	2.36	29, p. 1
3280-028	3/1/2007	<200	2.36	29, p. 1
3280-017	2/23/2007	<200	2.36	29, p. 1
3280-014	2/26/2007	<200	2.36	29, p. 1
3279-001	1/4/2007	<200	2.36	29, p. 1
3280-027	3/1/2007	<200	2.36	29, p. 1
3285-006	6/7/2007	<200	2.36	29, p. 1
3281-009	3/5/2007	<200	2.36	29, p. 1
3280-025	3/1/2007	<200	2.36	29, p. 1
3281-015	3/6/2007	<200	2.36	29, p. 1
3279-013	1/2/2007	<200	2.36	29, p. 1
3279-004	1/8/2007	<200	2.36	29, p. 1
3279-005	1/9/2007	<200	2.36	29, p. 1
3279-008	1/10/2007	<200	2.36	29, p. 1
3279-006	1/9/2007	<200	2.36	29, p. 1
3280-019	2/23/2007	<200	2.36	29, p. 1
3281-019	3/13/2007	<200	2.36	29, p. 1
3280-010	2/26/2007	<200	2.36	29, p. 1
3281-010	3/5/2007	<200	2.36	29, p. 1
3281-007	3/5/2007	<200	2.36	29, p. 1
3280-030	3/2/2007	<200	2.36	29, p. 1
3281-003	3/5/2007	<200	2.36	29, p. 1
3281-014	3/6/2007	<200	2.36	29, p. 1
3280-031	3/2/2007	<200	2.36	29, p. 1
3282-004	4/2/2007	<200	2.36	29, p. 1
3283-004	4/23/2007	<200	2.36	29, p. 1
3283-008	4/26/2007	<200	2.36	29, p. 1
3285-003	5/31/2007	<200	2.36	29, p. 1
3285-001	5/29/2007	<200	2.36	29, p. 1
Total Number of Residents and Students:			**835.04**	Not Applicable
Total Number of Workers:			**24**	

Note –

1 Worker population calculated based on the student to teacher ratio provided on page 1 of Reference 39, resulting in a total of 24 teachers for a factor value for workers of 5 (Ref. 1, pp. Table 5-4, 51647).

2 Please refer to section 5.1.1 of this HRS documentation record.

3 Please refer to the previous table identifying samples meeting observed contamination criteria.

Resident Population Threat Likelihood of Exposure Factor Category Value: 550

5.1.2 WASTE CHARACTERISTICS

5.1.2.1 Toxicity

As previously explained in this HRS documentation record, lead concentrations greater than or equal to three times the highest background concentration level have been detected in residential soils in all areas of observed contamination (please see pp. 20-30 of this HRS documentation record).

Hazardous Substance	Toxicity Factor Value	Reference
Lead	10,000	2, pp. 8, 9

Toxicity Factor Value: 10,000
(Ref. 1, Sections 2.4.1.1 and 5.1.2.1)

5.1.2.2 Hazardous Waste Quantity

Hazardous Constituent Quantity

The mass of CERCLA hazardous substances contained in areas of contamination is not known. The information available is not sufficient to evaluate Tier A, hazardous constituent quantity, as required by Reference 1, Sections 2.4.2.1.1 and 5.1.2.2.

Hazardous Constituent Quantity Assigned Value: NS

Hazardous Wastestream Quantity

The mass of CERCLA hazardous substances, pollutants, and contaminants contained in the areas of contamination A is not known. The information available is not sufficient to evaluate Tier B, hazardous wastestream quantity, as required by Reference 1, Sections 2.4.2.1.2 and 5.1.2.2.

Hazardous Wastestream Quantity Assigned Value: NS

Volume

The area of observed contamination is not a surface impoundment, drums, or tanks and containers other than drums, as required to evaluate Tier C, volume, by Reference 1, Sections 2.4.2.1.3 and 5.1.2.2, and Table 5-2.

Volume Assigned Value: 0

Area

The surface area covered by contaminated soil was not adequately determined for the area of observed contamination, but it is greater than zero. As contamination between individual areas of observed contamination were not inferred to occur, each sampling location identified as contaminated represents an undefined area and an area measurement for the areas of observed contamination could not be determined. Therefore, the areas of observed contamination are assigned a value of greater than zero, but undetermined.

Area Assigned Value: >0

The areas of contamination are assigned a hazardous waste quantity value of greater than zero, but undetermined. Thus, a value of 10 was assigned as stated in the HRS Rule (Ref. 1, Sections 2.4.2, 2.4.2.1, 2.4.2.1.4, 2.4.2.2 and 5.1.2.2).

Hazardous Waste Quantity Factor Value: 10
(Ref. 1, Section 2.4.2.2)

5.1.2.3 Calculation of Waste Characteristics Factor Category Value

Toxicity Factor Value: 10,000
Hazardous Waste Quantity Factor Value: 10

Toxicity Factor Value x Hazardous Waste Quantity Factor Value: $10{,}000 \times 10 = 1 \times 10^5$

Waste Characteristics Factor Category Value: 18
(Ref. 1, Sections 2.4.3 and 5.1.2.3; pp. 51592 (Table 2-7), 51647)

5.1.3 TARGETS

Only those individuals whose residence or school is both within said property boundary and within 200 feet of documented contamination meeting observed release criteria were counted as targets.

5.1.3.1 Resident Individual

As previously stated in the HRS documentation record, the samples were collected from depths of 0 to 2 inches below ground surface (bgs) (Ref. 6, p. 8; 7, p. 9). Because typical residential properties in the area of concern are less than 200 feet in length and width; all residential properties where soil sample analytical results indicate lead contamination significantly above the background level have residents living less than 200 feet from areas of observed contamination (confirmed by samples presented in section 5.1.1 of this HRS documentation record). While the KDHE RSK for lead (residential scenarios) is 400 mg/kg, there is no HRS health-based benchmark for lead in the soil exposure pathway. (Ref. 2, p. 9; 25, pp. 2, 34). Therefore, due to the absence of a benchmark for lead in soil, Level II was assigned (Ref. 1, Sections 5.1.3.1 and 5.1.3.2).

Level of Contamination (Level I/Level II): Level II

Resident Individual Factor Value: 45

5.1.3.2 Resident Population

5.1.3.2.1 Level I Concentrations

All residents and students located on or within 200 feet of an area of observed contamination, which is also located within the property boundary of that residence or school, were counted as Level II targets, as no samples were at or above a health-based benchmark. Thus, a Level I Concentrations Factor Value of 0 was assigned (Ref. 1, Sections 5.1.3.2 and 5.1.3.2.1).

Level I Concentrations Factor Value: 0

5.1.3.2.2 Level II Concentrations

Areas of observed contamination were established based on a lead concentration of greater than or equal to 366 mg/kg (three times the highest background level of 122 mg/kg). Therefore, any residences and schools located on or within 200 feet of an area of observed contamination, which is also within the property boundary of that residence or school, are subject to Level II concentrations. The resident population was determined by tabulating the number of residences and students located on or within 200 feet of an area of observed contamination, which is also within the property boundary of that residence or school, confirmed by samples presented in section 5.1.1 of this HRS documentation record.

The resident population is based on the average number of persons per household for Allen County, which according to the 2010 U.S. Census is 2.36 persons per household (Ref. 29, p. 1). The student populations at McKinley Elementary School and Jefferson Elementary School are 136 and 253, respectively (Ref. 39, p. 1; 54, p. 1). The summary of targets is presented in the abovementioned tables (Ref. 1, Section 5.1.3.2).

Level II Concentrations Factor Value: 835.04

5.1.3.3 Workers

As stated earlier, the number of workers was calculated on the student to teacher ratio provided in Reference 39, page 1 and Reference 54, page 1. Therefore, a value of 5 was assigned (Ref. 1, Section 5.1.3.3).

Workers Factor Value: 5

5.1.3.4 Resources

Description of Resource(s): No resources were identified.

Resources Factor Value: 0

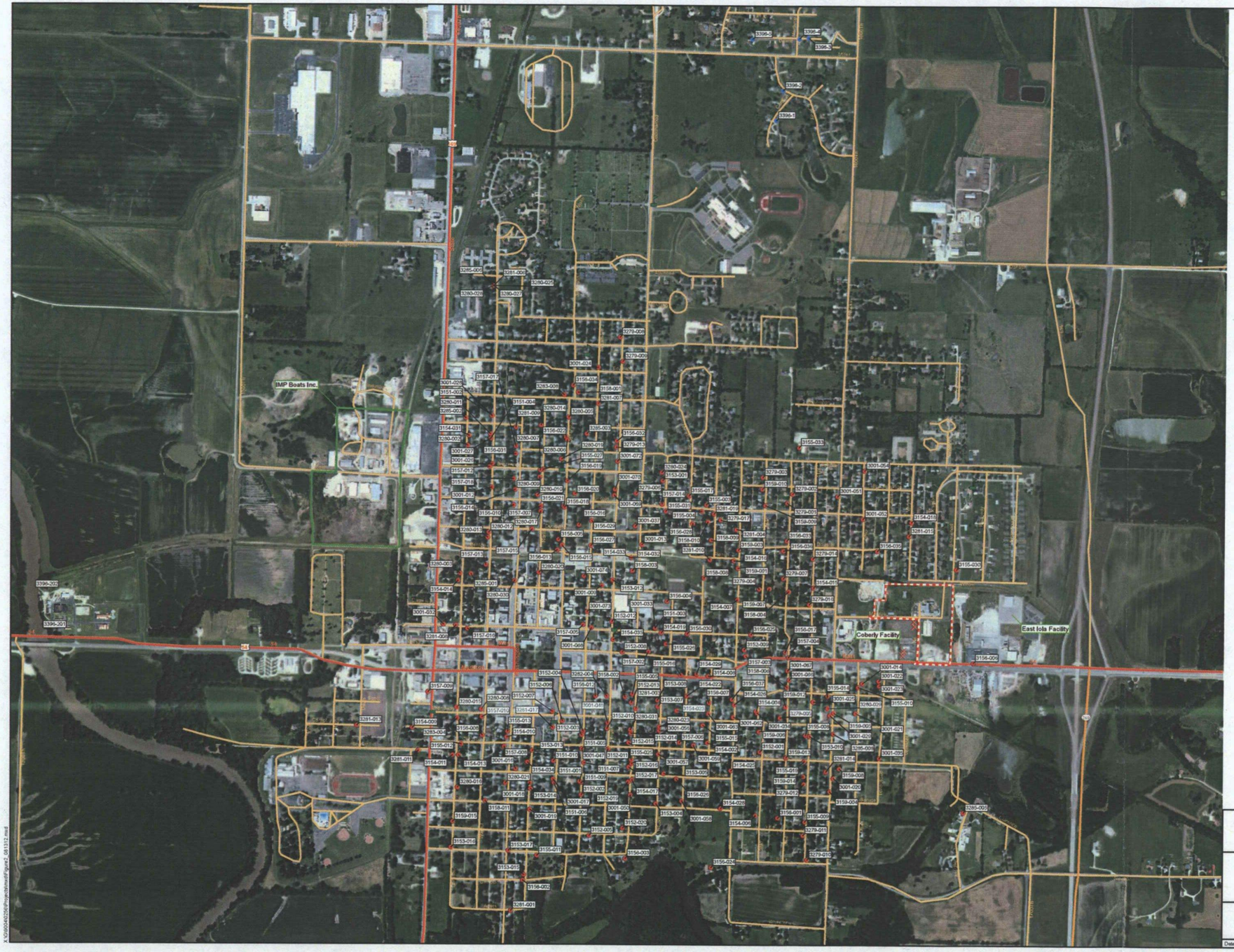
5.1.3.5 Terrestrial Sensitive Environments

No terrestrial sensitive environments were identified.

Terrestrial Sensitive Environments Factor Value: 0

5.2 NEARBY POPULATION THREAT

Nearby population threat was not scored.

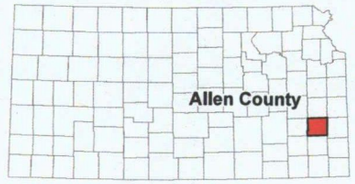


Legend

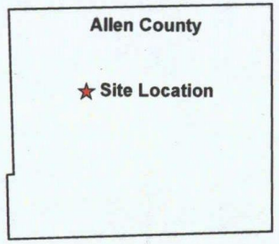
- Background location
- Lead Results > 366 ppm
- Schools
- Former United Zinc #1
- Slag Pile
- Highway
- Major Road
- Local Road
- Minor Road
- Other Road

ppm parts per million

County Locator



Site Locator



N

0 600 1,200

Scale in Feet

Source: Allen Co., Kansas DOQQ Tileset, 2003
ESRI Data Maps, Bing Maps Aerial, 2010

Former United Zinc and Associated Smelters
Iola, Kansas

Figure 2
Areas of Contamination
(Lead > 366 parts per million)

TETRA TECH EM INC.

Date: 8/13/2012 Drawn By: Gustavo Orozco Project No: X9004L11.0250.000

X:\X9004\0250\Projects\mxd\Figure2_081313.mxd

12-14-90
Vol. 55 No. 241

federal register

Friday
December 14, 1990

Book 2

United States
Government
Printing Office
SUPERINTENDENT
OF DOCUMENTS
Washington, DC 20402

OFFICIAL BUSINESS
Penalty for private use, $300

SECOND CLASS NEWSPAPER

Postage and Fees Paid
U.S. Government Printing Office
(ISSN 0097-6326)

2

SUPERFUND CHECMICAL DATA MATRIX

Prepared for U.S. Environmental Protection Agency

March 31, 2012

SUPERFUND CHEMICAL DATA MATRIX

Date: 3/31/2012
Chemical: Arsenic
CAS Number: 007440-38-2

TOXICITY

Parameter	Value		Unit	Source
Oral RfD:	3.0E-4		mg/kg/day	IRIS
Inhal RfD:			mg/kg/day	
Oral Slope:	1.5E+0		(mg/kg/day)^-1	IRIS
Oral Wt-of-Evid:	A			
Inhal Slope:	1.5E+1		(mg/kg/day)^-1	IRIS
Inhal Wt-of-Evid:	A			
Oral ED10:	7.0E-3		mg/kg/day	EPA_ED10
Oral ED10 Wgt:	A			
Inhal ED10:	7.0E-3		mg/kg/day	EPA_ED10
Inhal ED10 Wgt:	A			
Oral LD50:			mg/kg	
Dermal LD50:			mg/kg	
Gas Inhal LC50:			ppm	
Dust Inhal LC50:			mg/L	
ACUTE				
Fresh CMC:	3.4E+2	A, D, K	µg/L	WATCRIT
Salt CMC:	6.9E+1	A, D, bb	µg/L	WATCRIT
CHRONIC				
Fresh CCC:	1.5E+2	A, D, K	µg/L	WATCRIT
Salt CCC:	3.6E+1	A, D, bb	µg/L	WATCRIT
Fresh Ecol LC50:	1.5E+3		µg/L	ECOTOX
Salt Ecol LC50:	3.9E+2		µg/L	ECOTOX

PERSISTENCE

Parameter	Value	Unit	Source
LAKE - Halflives			
Hydrolysis:		days	
Volatility:		days	
Photolysis:		days	
Biodeg:		days	
Radio:		days	
RIVER - Halflives			
Hydrolysis:		days	
Volatility:		days	
Photolysis:		days	
Biodeg:		days	
Radio:		days	
Log Kow:	6.8E-1		PHYSPROP

PHYSICAL CHARACTERISTICS

Parameter	Value		
Metal Contain:	Yes		
Organic:	No		
Gas:	No		
Particulate:	Yes		
Radionuclide:	No		
Rad. Element:	No		
Molecular Weight:	7.5E+1		
Density:	5.8E+0	g/mL @	C

MOBILITY

Parameter	Value	Unit	Source
Vapor Press:		Torr	
Henry's Law:	7.7E-1	atm-m3/mol	PHYSPROP
Water Solub:		mg/L	
Distrib Coef:	2.9E+1	ml/g	SSG_KD
Geo Mean Sol:	1.2E+5	mg/L	CALC

BIOACCUMULATION

Parameter	Value	Unit	Source
FOOD CHAIN			
Fresh BCF:	4.0E+0		VER_BCF
Salt BCF:	3.5E+2		VER_BCF
ENVIRONMENTAL			
Fresh BCF:	8.7E+3		ECOTOX
Salt BCF:	3.5E+2		VER_BCF
Log Kow:	6.8E-1		PHYSPROP
Water Solub:			
Geo Mean Sol:	1.2E+5	mg/L	CALC

OTHER DATA

Melting Point:	8.2E+2	C
Boiling Point:	6.0E+2	C
Formula:	As	

CLASS INFORMATION

Class	Parent Substance

SUPERFUND CHEMICAL DATA MATRIX

Date: 3/31/2012
Chemical: Arsenic
CAS Number: 007440-38-2

ASSIGNED FACTOR VALUES

AIR PATHWAY

Parameter	Value
Toxicity:	10000
Gas Mobility:	
Gas Migration:	

GROUND WATER PATHWAY

Parameter		Value
Toxicity:		10000
Water Solub:		
Distrib:		2.9E+1
Geo Mean Sol:		1.2E+5
Mobility:		
Liquid	Karst:	1.0E+0
	Non Karst:	1.0E-2
Non Liq.	Karst:	1.0E+0
	Non Karst:	1.0E-2

SOIL EXPOSURE PATHWAY

Parameter	Value
Toxicity:	10000

SURFACE WATER PATHWAY

DRINKING WATER

Parameter	Value
Toxicity:	10000
Persistence	
River:	1.0000
Lake:	1.0000

HUMAN FOOD CHAIN

Parameter	Value
Toxicity:	10000
Persistence	
River:	1.0000
Lake:	1.0000
Bioaccumulation	
Fresh:	5.0
Salt:	500.0

ENVIRONMENTAL

Parameter	Value
Fresh Tox:	10
Salt Tox:	100
Persistence	
River:	1.0000
Lake:	1.0000
Bioaccumulation	
Fresh:	5000.0
Salt:	500.0

BENCHMARKS

AIR PATHWAY

Parameter	Value	Unit
NAAQS/NESHAPS:		µg/m3
Cancer Risk:	5.7E-7	mg/m3
Non Cancer Risk:		mg/m3

GROUND WATER PATHWAY

Parameter	Value	Unit
MCL/MCLG:	1.0E-2	mg/L
Cancer Risk:	5.7E-5	mg/L
Non Cancer Risk:	1.1E-2	mg/L

SOIL EXPOSURE PATHWAY

Parameter	Value	Unit
Cancer Risk:	4.3E-1	mg/kg
Non Cancer Risk:	2.3E+1	mg/kg

RADIONUCLIDE

Parameter	Value	Unit
MCL:		pCi/L
UMTRCA:		pCi/kg
CANCER RISK		
Air:		pCi/m3
DW:		pCi/L
FC:		pCi/kg
Soil Ing:		pCi/kg
Soil Gam:		pCi/kg

SURFACE WATER PATHWAY

DRINKING WATER

Parameter	Value	Unit
MCL/MCLG:	1.0E-2	mg/L
Cancer Risk:	5.7E-5	mg/L
Non Cancer Risk:	1.1E-2	mg/L

HUMAN FOOD CHAIN

Parameter	Value	Unit
FDAAL:		ppm
Cancer Risk:	2.1E-3	mg/kg
Non Cancer Risk:	4.1E-1	mg/kg

ENVIRONMENTAL

Parameter	Value	Unit
ACUTE		
Fresh CMC:	3.4E+2 [A, D, K]	µg/L
Salt CMC:	6.9E+1 [A, D, bb]	µg/L
CHRONIC		
Fresh CCC:	1.5E+2 [A, D, K]	µg/L
Salt CCC:	3.6E+1 [A, D, bb]	µg/L

SUPERFUND CHEMICAL DATA MATRIX

Date: 3/31/2012
Chemical: Barium
CAS Number: 007440-39-3

TOXICITY

Parameter	Value	Unit	Source
Oral RfD:	7.0E-2	mg/kg/day	IRIS
Inhal RfD:	1.4E-4	mg/kg/day	HEAST
Oral Slope:		(mg/kg/day)^-1	
Oral Wt-of-Evid:			
Inhal Slope:		(mg/kg/day)^-1	
Inhal Wt-of-Evid:			
Oral ED10:		mg/kg/day	
Oral ED10 Wgt:			
Inhal ED10:		mg/kg/day	
Inhal ED10 Wgt:			
Oral LD50:	2.0E+3	mg/kg	ACGIH
Dermal LD50:		mg/kg	
Gas Inhal LC50:		ppm	
Dust Inhal LC50:		mg/L	
ACUTE			
Fresh CMC:		µg/L	
Salt CMC:		µg/L	
CHRONIC			
Fresh CCC:		µg/L	
Salt CCC:		µg/L	
Fresh Ecol LC50:	3.2E+5	µg/L	ECOTOX
Salt Ecol LC50:	5.0E+5	µg/L	ECOTOX

PERSISTENCE

Parameter	Value	Unit	Source
LAKE - Halflives			
Hydrolysis:		days	
Volatility:		days	
Photolysis:		days	
Biodeg:		days	
Radio:		days	
RIVER - Halflives			
Hydrolysis:		days	
Volatility:		days	
Photolysis:		days	
Biodeg:		days	
Radio:		days	
Log Kow:	2.3E-1		PHYSPROP

PHYSICAL CHARACTERISTICS

Parameter	Value	
Metal Contain:	Yes	
Organic:	No	
Gas:	No	
Particulate:	Yes	
Radionuclide:	No	
Rad. Element:	No	
Molecular Weight:	1.4E+2	
Density:	3.6E+0	g/mL @ 20.00 C

MOBILITY

Parameter	Value	Unit	Source
Vapor Press:		Torr	
Henry's Law:		atm-m3/mol	
Water Solub:		mg/L	
Distrib Coef:	4.1E+1	ml/g	SSG_KD
Geo Mean Sol:	2.8E+3	mg/L	CALC

BIOACCUMULATION

Parameter	Value	Unit	Source
FOOD CHAIN			
Fresh BCF:			
Salt BCF:	7.0E+2		ECOTOX
ENVIRONMENTAL			
Fresh BCF:			
Salt BCF:	7.0E+2		ECOTOX
Log Kow:	2.3E-1		PHYSPROP
Water Solub:			
Geo Mean Sol:	2.8E+3	mg/L	CALC

OTHER DATA

Melting Point:	7.3E+2	C
Boiling Point:	1.9E+3	C
Formula:	Ba	

CLASS INFORMATION

Class	Parent Substance

SUPERFUND CHEMICAL DATA MATRIX

Date: 3/31/2012
Chemical: Barium

CAS Number: 007440-39-3

ASSIGNED FACTOR VALUES

AIR PATHWAY

Parameter	Value
Toxicity:	10000
Gas Mobility:	
Gas Migration:	

GROUND WATER PATHWAY

Parameter		Value
Toxicity:		10000
Water Solub:		
Distrib:		4.1E+1
Geo Mean Sol:		2.8E+3
Mobility:		
Liquid	Karst:	1.0E+0
	Non Karst:	1.0E-2
Non Liq.	Karst:	1.0E+0
	Non Karst:	1.0E-2

SOIL EXPOSURE PATHWAY

Parameter	Value
Toxicity:	10000

SURFACE WATER PATHWAY

DRINKING WATER

Parameter	Value
Toxicity:	10000
Persistence	
River:	1.0000
Lake:	1.0000

HUMAN FOOD CHAIN

Parameter	Value
Toxicity:	10000
Persistence	
River:	1.0000
Lake:	1.0000
Bioaccumulation	
Fresh:	500.0
Salt:	500.0

ENVIRONMENTAL

Parameter	Value
Fresh Tox:	1
Salt Tox:	1
Persistence	
River:	1.0000
Lake:	1.0000
Bioaccumulation	
Fresh:	500.0
Salt:	500.0

BENCHMARKS

AIR PATHWAY

Parameter	Value	Unit
NAAQS/NESHAPS:		µg/m3
Cancer Risk:		mg/m3
Non Cancer Risk:	5.2E-4	mg/m3

GROUND WATER PATHWAY

Parameter	Value	Unit
MCL/MCLG:	2.0E+0	mg/L
Cancer Risk:		mg/L
Non Cancer Risk:	2.6E+0	mg/L

SOIL EXPOSURE PATHWAY

Parameter	Value	Unit
Cancer Risk:		mg/kg
Non Cancer Risk:	5.5E+3	mg/kg

RADIONUCLIDE

Parameter	Value	Unit
MCL:		pCi/L
UMTRCA:		pCi/kg
CANCER RISK		
Air:		pCi/m3
DW:		pCi/L
FC:		pCi/kg
Soil Ing:		pCi/kg
Soil Gam:		pCi/kg

SURFACE WATER PATHWAY

DRINKING WATER

Parameter	Value	Unit
MCL/MCLG:	2.0E+0	mg/L
Cancer Risk:		mg/L
Non Cancer Risk:	2.6E+0	mg/L

HUMAN FOOD CHAIN

Parameter	Value	Unit
FDAAL:		ppm
Cancer Risk:		mg/kg
Non Cancer Risk:	9.5E+1	mg/kg

ENVIRONMENTAL

Parameter	Value	Unit
ACUTE		
Fresh CMC:		µg/L
Salt CMC:		µg/L
CHRONIC		
Fresh CCC:		µg/L
Salt CCC:		µg/L

SUPERFUND CHEMICAL DATA MATRIX

Date: 3/31/2012
Chemical: Cadmium
CAS Number: 007440-43-9

TOXICITY

Parameter	Value		Unit	Source
Oral RfD:	5.0E-4		mg/kg/day	IRIS
Inhal RfD:	2.6E-4		mg/kg/day	STSC
Oral Slope:			(mg/kg/day)^-1	
Oral Wt-of-Evid:				
Inhal Slope:	6.3E+0		(mg/kg/day)^-1	IRIS
Inhal Wt-of-Evid:	B1			
Oral ED10:	1.7E-2		mg/kg/day	EPA_ED10
Oral ED10 Wgt:	B1			
Inhal ED10:	1.7E-2		mg/kg/day	EPA_ED10
Inhal ED10 Wgt:	B1			
Oral LD50:	2.3E+3		mg/kg	RTECS
Dermal LD50:			mg/kg	
Gas Inhal LC50:			ppm	
Dust Inhal LC50:	2.1E+1		mg/L	RTECS
ACUTE				
Fresh CMC:	2.0E+0	D, E, K, bb	µg/L	WATCRIT
Salt CMC:	4.0E+1	D, bb	µg/L	WATCRIT
CHRONIC				
Fresh CCC:	2.5E-1	D, E, K, bb	µg/L	WATCRIT
Salt CCC:	8.8E+0	D, bb	µg/L	WATCRIT
Fresh Ecol LC50:	4.0E-1		µg/L	ECOTOX
Salt Ecol LC50:	2.0E-1		µg/L	ECOTOX

PERSISTENCE

Parameter	Value	Unit	Source
LAKE - Halflives			
Hydrolysis:		days	
Volatility:		days	
Photolysis:		days	
Biodeg:		days	
Radio:		days	
RIVER - Halflives			
Hydrolysis:		days	
Volatility:		days	
Photolysis:		days	
Biodeg:		days	
Radio:		days	
Log Kow:	-7.0E-2		PHYSPROP

PHYSICAL CHARACTERISTICS

Parameter	Value		
Metal Contain:	Yes		
Organic:	No		
Gas:	No		
Particulate:	Yes		
Radionuclide:	No		
Rad. Element:	No		
Molecular Weight:	1.1E+2		
Density:	8.7E+0	g/mL @	C

MOBILITY

Parameter	Value	Unit	Source
Vapor Press:		Torr	
Henry's Law:	3.1E-2	atm-m3/mol	PHYSPROP
Water Solub:		mg/L	
Distrib Coef:	7.5E+1	ml/g	SSG_KD
Geo Mean Sol:	1.7E+3	mg/L	CALC

BIOACCUMULATION

Parameter	Value	Unit	Source
FOOD CHAIN			
Fresh BCF:	1.0E+3		ECOTOX
Salt BCF:	5.0E+4		ECOTOX
ENVIRONMENTAL			
Fresh BCF:	2.0E+5		ECOTOX
Salt BCF:	5.0E+4		ECOTOX
Log Kow:	-7.0E-2		PHYSPROP
Water Solub:			
Geo Mean Sol:	1.7E+3	mg/L	CALC

OTHER DATA

Melting Point:	3.2E+2	C
Boiling Point:	7.7E+2	C
Formula:	Cd	

CLASS INFORMATION

Class	Parent Substance

SUPERFUND CHEMICAL DATA MATRIX

Date: 3/31/2012
Chemical: Cadmium
CAS Number: 007440-43-9

ASSIGNED FACTOR VALUES

AIR PATHWAY

Parameter	Value
Toxicity:	10000
Gas Mobility:	
Gas Migration:	

GROUND WATER PATHWAY

Parameter		Value
Toxicity:		10000
Water Solub:		
Distrib:		7.5E+1
Geo Mean Sol:		1.7E+3
Mobility:		
Liquid	Karst:	1.0E+0
	Non Karst:	1.0E-2
Non Liq.	Karst:	1.0E+0
	Non Karst:	1.0E-2

SOIL EXPOSURE PATHWAY

Parameter	Value
Toxicity:	10000

SURFACE WATER PATHWAY

DRINKING WATER

Parameter	Value
Toxicity:	10000
Persistence	
River:	1.0000
Lake:	1.0000

HUMAN FOOD CHAIN

Parameter	Value
Toxicity:	10000
Persistence	
River:	1.0000
Lake:	1.0000
Bioaccumulation	
Fresh:	5000.0
Salt:	50000.0

ENVIRONMENTAL

Parameter	Value
Fresh Tox:	10000
Salt Tox:	1000
Persistence	
River:	1.0000
Lake:	1.0000
Bioaccumulation	
Fresh:	50000.0
Salt:	50000.0

BENCHMARKS

AIR PATHWAY

Parameter	Value	Unit
NAAQS/NESHAPS:		µg/m3
Cancer Risk:	1.4E-6	mg/m3
Non Cancer Risk:	9.4E-4	mg/m3

GROUND WATER PATHWAY

Parameter	Value	Unit
MCL/MCLG:	5.0E-3	mg/L
Cancer Risk:		mg/L
Non Cancer Risk:	1.8E-2	mg/L

SOIL EXPOSURE PATHWAY

Parameter	Value	Unit
Cancer Risk:		mg/kg
Non Cancer Risk:	3.9E+1	mg/kg

RADIONUCLIDE

Parameter	Value	Unit
MCL:		pCi/L
UMTRCA:		pCi/kg
CANCER RISK		
Air:		pCi/m3
DW:		pCi/L
FC:		pCi/kg
Soil Ing:		pCi/kg
Soil Gam:		pCi/kg

SURFACE WATER PATHWAY

DRINKING WATER

Parameter	Value	Unit
MCL/MCLG:	5.0E-3	mg/L
Cancer Risk:		mg/L
Non Cancer Risk:	1.8E-2	mg/L

HUMAN FOOD CHAIN

Parameter	Value	Unit
FDAAL:		ppm
Cancer Risk:		mg/kg
Non Cancer Risk:	6.8E-1	mg/kg

ENVIRONMENTAL

Parameter	Value	Unit
ACUTE		
Fresh CMC:	2.0E+0 [D, E, K, bb]	µg/L
Salt CMC:	4.0E+1 [D, bb]	µg/L
CHRONIC		
Fresh CCC:	2.5E-1 [D, E, K, bb]	µg/L
Salt CCC:	8.8E+0 [D, bb]	µg/L

SUPERFUND CHEMICAL DATA MATRIX

Date: 3/31/2012
Chemical: Lead
CAS Number: 007439-92-1

TOXICITY

Parameter	Value		Unit	Source
Oral RfD:			mg/kg/day	
Inhal RfD:			mg/kg/day	
Oral Slope:			(mg/kg/day)^-1	
Oral Wt-of-Evid:				
Inhal Slope:			(mg/kg/day)^-1	
Inhal Wt-of-Evid:				
Oral ED10:			mg/kg/day	
Oral ED10 Wgt:				
Inhal ED10:			mg/kg/day	
Inhal ED10 Wgt:				
Oral LD50:			mg/kg	
Dermal LD50:			mg/kg	
Gas Inhal LC50:			ppm	
Dust Inhal LC50:			mg/L	
ACUTE				
Fresh CMC:	6.5E+1	D, E, bb, gg	µg/L	WATCRIT
Salt CMC:	2.1E+2	D, bb	µg/L	WATCRIT
CHRONIC				
Fresh CCC:	2.5E+0	D, E, bb, gg	µg/L	WATCRIT
Salt CCC:	8.1E+0	D, bb	µg/L	WATCRIT
Fresh Ecol LC50:	4.4E+2		µg/L	ECOTOX
Salt Ecol LC50:	1.1E+2		µg/L	ECOTOX

PERSISTENCE

Parameter	Value	Unit	Source
LAKE - Halflives			
Hydrolysis:		days	
Volatility:		days	
Photolysis:		days	
Biodeg:		days	
Radio:		days	
RIVER - Halflives			
Hydrolysis:		days	
Volatility:		days	
Photolysis:		days	
Biodeg:		days	
Radio:		days	
Log Kow:	7.3E-1		PHYSPROP

PHYSICAL CHARACTERISTICS

Parameter	Value		
Metal Contain:	Yes		
Organic:	No		
Gas:	No		
Particulate:	Yes		
Radionuclide:	No		
Rad. Element:	No		
Molecular Weight:	2.1E+2		
Density:	1.1E+1	g/mL @	C

MOBILITY

Parameter	Value	Unit	Source
Vapor Press:		Torr	
Henry's Law:	2.5E-2	atm-m3/mol	PHYSPROP
Water Solub:		mg/L	
Distrib Coef:	9.0E+2	ml/g	BAES_KD
Geo Mean Sol:	8.7E+2	mg/L	CALC

BIOACCUMULATION

Parameter	Value	Unit	Source
FOOD CHAIN			
Fresh BCF:	8.7E+0		ECOTOX
Salt BCF:	5.0E+3		ECOTOX
ENVIRONMENTAL			
Fresh BCF:	1.7E+4		ECOTOX
Salt BCF:	5.0E+3		ECOTOX
Log Kow:	7.3E-1		PHYSPROP
Water Solub:			
Geo Mean Sol:	8.7E+2	mg/L	CALC

OTHER DATA

Melting Point:	3.3E+2	C
Boiling Point:	1.7E+3	C
Formula:	Pb	

CLASS INFORMATION

Class	Parent Substance

SUPERFUND CHEMICAL DATA MATRIX

Date: 3/31/2012
Chemical: Lead
CAS Number: 007439-92-1

ASSIGNED FACTOR VALUES

AIR PATHWAY

Parameter	Value
Toxicity:	10000
Gas Mobility:	
Gas Migration:	

GROUND WATER PATHWAY

Parameter		Value
Toxicity:		10000
Water Solub:		
Distrib:		9.0E+2
Geo Mean Sol:		8.7E+2
Mobility:		
Liquid	Karst:	1.0E+0
	Non Karst:	1.0E-2
Non Liq..	Karst:	1.0E+0
	Non Karst:	1.0E-2

SOIL EXPOSURE PATHWAY

Parameter	Value
Toxicity:	10000

SURFACE WATER PATHWAY

DRINKING WATER

Parameter	Value
Toxicity:	10000
Persistence	
River:	1.0000
Lake:	1.0000

HUMAN FOOD CHAIN

Parameter	Value
Toxicity:	10000
Persistence	
River:	1.0000
Lake:	1.0000
Bioaccumulation	
Fresh:	5.0
Salt:	5000.0

ENVIRONMENTAL

Parameter	Value
Fresh Tox:	1000
Salt Tox:	1000
Persistence	
River:	1.0000
Lake:	1.0000
Bioaccumulation	
Fresh:	50000.0
Salt:	5000.0

BENCHMARKS

AIR PATHWAY

Parameter	Value	Unit
NAAQS/NESHAPS:	1.5E+0	µg/m3
Cancer Risk:		mg/m3
Non Cancer Risk:		mg/m3

GROUND WATER PATHWAY

Parameter	Value	Unit
MCL/MCLG:	1.5E-2	mg/L
Cancer Risk:		mg/L
Non Cancer Risk:		mg/L

SOIL EXPOSURE PATHWAY

Parameter	Value	Unit
Cancer Risk:		mg/kg
Non Cancer Risk:		mg/kg

RADIONUCLIDE

Parameter	Value	Unit
MCL:		pCi/L
UMTRCA:		pCi/kg
CANCER RISK		
Air:		pCi/m3
DW:		pCi/L
FC:		pCi/kg
Soil Ing:		pCi/kg
Soil Gam:		pCi/kg

SURFACE WATER PATHWAY

DRINKING WATER

Parameter	Value	Unit
MCL/MCLG:	1.5E-2	mg/L
Cancer Risk:		mg/L
Non Cancer Risk:		mg/L

HUMAN FOOD CHAIN

Parameter	Value	Unit
FDAAL:		ppm
Cancer Risk:		mg/kg
Non Cancer Risk:		mg/kg

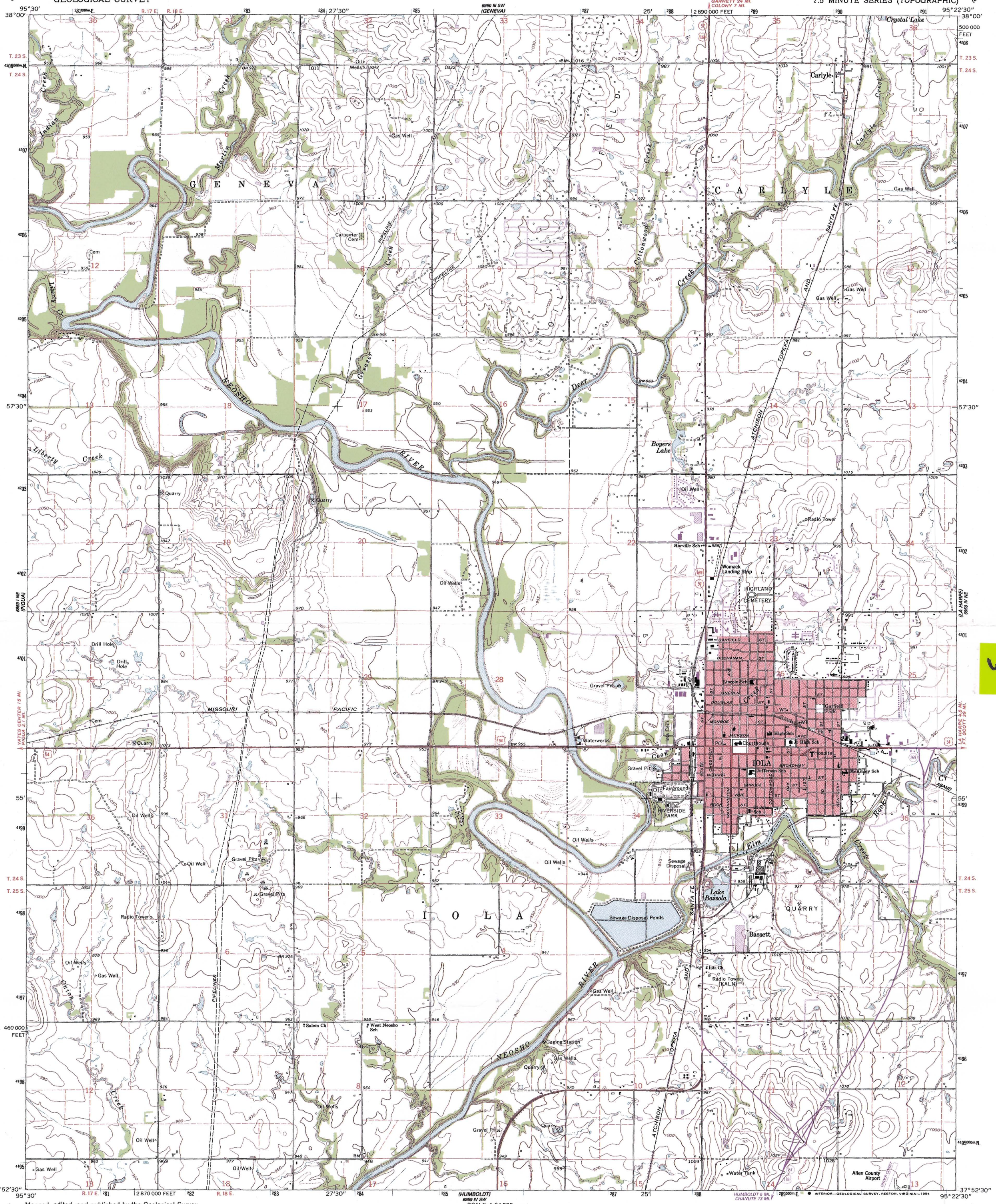
ENVIRONMENTAL

Parameter	Value	Unit
ACUTE		
Fresh CMC:	6.5E+1 [D, E, bb, gg]	µg/L
Salt CMC:	2.1E+2 [D, bb]	µg/L
CHRONIC		
Fresh CCC:	2.5E+0 [D, E, bb, gg]	µg/L
Salt CCC:	8.1E+0 [D, bb]	µg/L

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

STATE OF KANSAS

IOLA QUADRANGLE
KANSAS–ALLEN CO.
7.5 MINUTE SERIES (TOPOGRAPHIC)



Mapped, edited, and published by the Geological Survey in cooperation with State of Kansas agencies

Control by USGS and USC&GS

Topography by photogrammetric methods from aerial photographs taken 1965. Field checked 1966

Polyconic projection. 1927 North American datum
10,000-foot grid based on Kansas coordinate system, south zone
1000-meter Universal Transverse Mercator grid ticks, zone 15, shown in blue

Red tint indicates areas in which only landmark buildings are shown

To place on the predicted North American Datum 1983, move the projection lines 22 meters east as shown by dashed corner ticks

Revisions shown in purple compiled from aerial photographs taken 1981 and other sources. This information not field checked. Map edited 1984

MN
GN
1°30′ 27 MILS
6½° 116 MILS

UTM GRID AND 1984 MAGNETIC NORTH DECLINATION AT CENTER OF SHEET

SCALE 1:24 000

1 ½ 0 1 MILE

1000 0 1000 2000 3000 4000 5000 6000 7000 FEET

1 .5 0 1 KILOMETER

CONTOUR INTERVAL 10 FEET
DOTTED LINES REPRESENT 5-FOOT CONTOURS
NATIONAL GEODETIC VERTICAL DATUM OF 1929

THIS MAP COMPLIES WITH NATIONAL MAP ACCURACY STANDARDS
FOR SALE BY U. S. GEOLOGICAL SURVEY, DENVER, COLORADO 80225, OR RESTON, VIRGINIA 22092
AND KANSAS GEOLOGICAL SURVEY, LAWRENCE, KANSAS 66044
A FOLDER DESCRIBING TOPOGRAPHIC MAPS AND SYMBOLS IS AVAILABLE ON REQUEST

KANSAS
QUADRANGLE LOCATION

ROAD CLASSIFICATION

Heavy-duty — Light-duty
Medium-duty — Unimproved dirt
U. S. Route — State Route

IOLA, KANS.

37095-H4-TF-024

1966
PHOTOREVISED 1984
DMA 6959 IV NW—SERIES V878

TETRA TECH

January 18, 2008

Mr. Roy Crossland
START Project Officer
U.S. Environmental Protection Agency, Region 7
901 North 5th Street
Kansas City, Kansas 66101

Subject: **Site Inspection**
United Zinc No. 1, Iola, Kansas
EPA ID: KSN000705026
U.S. EPA Region 7 START 3, Contract No. EP-S7-06-01
Task Order No. 0038.000
Task Monitor: Paul Roemerman, Site Assessment Manager and Kansas State Coordinator

Dear Mr. Crossland:

The Tetra Tech EM Inc. is submitting the enclosed Site Inspection report for the above-referenced facility. If you have any questions or comments regarding this submittal, please call the project manager at (816) 412-1778.

Sincerely,

Kumud Pyakuryal
START Project Manager

Ted Faile, PG, CHMM
START Program Manager

Enclosure

Tetra Tech EM Inc.
415 Oak Street, Kansas City, MO 64106
Tel 816.412.1741 Fax 816.410.1748 www.tetratech.com

SITE INSPECTION
UNITED ZINC NO. 1
IOLA, KANSAS

CERCLIS ID No. KSN000705026

Superfund Technical Assessment and Response Team (START) 3

Contract No. EP-S7-06-01, Task Order No. 0038

Prepared For:

U.S. Environmental Protection Agency
Region 7
901 North 5th Street
Kansas City, Kansas 66101

January 18, 2008

Prepared By:

Tetra Tech EM Inc.
415 Oak Street
Kansas City, Missouri 64106
(816) 412-1741

CONTENTS

Section **Page**

1.0 INTRODUCTION 1

2.0 SITE DESCRIPTION AND HISTORY 1

2.1 SITE LOCATION 2
2.2 SITE DESCRIPTION 2
2.3 OPERATIONAL HISTORY 2
2.4 REGULATORY INVOLVEMENT 3

2.4.1 Kansas Department of Health and Environment 3
2.4.2 U.S. Environmental Protection Agency 4

3.0 INVESTIGATIVE EFFORTS 5

3.1 PREVIOUS SAMPLING 5

3.1.1 Smelter Waste Sampling 5
3.1.2 Soil Sampling 6
3.1.3 Groundwater Sampling 11
3.1.4 Surface Water and Sediment Sampling 11

3.2 SI SAMPLING 11

3.2.1 Soil Sampling 12
3.2.2 Groundwater Sampling 14
3.2.3 Surface Water and Sediment Sampling 14
3.2.4 Surface Water Intake Sampling 17

4.0 HAZARD RANKING SYSTEM FACTORS 19

4.1 SOURCES OF CONTAMINATION 19
4.2 GROUNDWATER PATHWAY 19

4.2.1 Hydrogeologic Setting 19
4.2.2 Groundwater Targets 20
4.2.3 Groundwater Pathway Conclusion 20

4.3 SURFACE WATER PATHWAY 20

4.3.1 Hydrologic Setting 21
4.3.2 Surface Water Targets 21
4.3.3 Surface Water Pathway Conclusion 21

CONTENTS (Continued)

Section **Page**

4.4 SOIL EXPOSURE AND AIR PATHWAYS 22

4.4.1 Physical Conditions 22
4.4.2 Soil and Air Targets 23
4.4.3 Soil Exposure and Air Pathway Conclusion 23

5.0 EMERGENCY RESPONSE CONSIDERATIONS 24

6.0 SUMMARY 24

7.0 REFERENCES 26

Appendix

A FIGURES

B FIELD SHEETS, CHAIN-OF-CUSTODY RECORDS, AND LOGBOOK

C ANALYTICAL RESULTS

D RESIDENTIAL PROPERTY SCREENING FORMS

TABLES

Table **Page**

1 SUMMARY OF LABORATORY LEAD CONCENTRATIONS EXCEEDING KDHE RSK RESIDENTIAL SOIL PATHWAY VALUE 7

2 BACKGROUND SOIL SAMPLE SUMMARY 12

3 ANALYTICAL DATA FOR BACKGROUND SOIL SAMPLES 13

4 SEDIMENT AND SURFACE WATER SAMPLE SUMMARY 15

5 ANALYTICAL DATA FOR SEDIMENT SAMPLES 16

6 ANALYTICAL DATA FOR SURFACE WATER SAMPLES 17

7 SURFACE WATER SAMPLE SUMMARY 18

8 ANALYTICAL DATA FOR SURFACE WATER INTAKE SAMPLES 18

1.0 INTRODUCTION

The U.S. Environmental Protection Agency (EPA), Region 7, under the authority of the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA) and the Superfund Amendments and Reauthorization Act of 1986 (SARA), tasked Tetra Tech EM, Inc. (Tetra Tech) to conduct a site inspection (SI) at the United Zinc No. 1 (United Zinc) facility in Iola, Allen County, Kansas, under Superfund Technical Assessment and Response Team (START) 3 contract.

The purpose of the SI was to identify site-specific background levels of arsenic and lead in the soil, collect surface water and sediment samples from areas where runoff drains from the site, and collect surface water samples from the surface water intake along Neosho River that provides the drinking water supply to the residents of Iola. In February 2007 a Preliminary Assessment (PA) report prepared on behalf of the EPA indicated a release of contaminants associated with past activities at United Zinc. Results of the PA sampling effort indicated the presence of lead at concentrations exceeding the Kansas Department of Health and Environment (KDHE) Risk-Based Standards for Kansas (RSK) Residential Soil Pathway value that was revised in June 2007. Contaminated soils encompass much more than just the former United Zinc property. Lead-contaminated soil was identified in 148 residential samples during the PA, exceeding the KDHE RSK residential soil pathway value of 400 milligram per kilogram (mg/kg).

United Zinc was identified as a potential hazardous waste site and entered into the Comprehensive Environmental Response, Compensation, and Liability Information System (CERCLIS) on October 4, 2005 (KSN000705026) (EPA 2006). This report summarizes the findings of the SI activities.

Apparent Problem

The operational history of the facility is described in Section 2.3. Previous investigations have documented elevated concentrations of arsenic, barium, cadmium, lead, and zinc in the surface soils at day care facilities, schools, parks, and residential properties surrounding the former zinc and lead smelting facility.

2.0 SITE DESCRIPTION AND HISTORY

The facility location, description, operational history, waste characteristics, and previous investigations at United Zinc are discussed below.

2.1 SITE LOCATION

United Zinc is located within the city boundaries of Iola, Allen County, Kansas, on the north side of Highway 54 along Kansas Drive, and is the location of the former United Zinc and Chemical Company Zinc and Lead Smelter. The facility is located on the east side of Iola within a mixture of residential and commercial properties. United Zinc is located in Sections 25 of Township 24 South, Range 18 East (KDHE 2005), as depicted on the U.S. Geological Survey (USGS) 7.5-minute topographic quadrangle map of Iola, Kansas (USGS 1984). The approximate geographic coordinates for the central portion of the facility are 37.9222800 degrees north latitude and 95.385900 degrees west longitude (Maxim Technologies, Inc. [Maxim] 2003). The location of the facility is shown in Appendix A, Figure 1.

2.2 SITE DESCRIPTION

The former United Zinc smelter facility was comprised of 10 parcels of land, equivalent to approximately 17 acres, but the overall site area evaluated includes a much larger surrounding section. The property has been graded, leveled, and developed since the former smelter operations ceased in the 1920s (Maxim 2003). Most of the property where the former smelter was located is vacant but includes the following businesses: Brenntag Southwest, Inc. (Chemical Distribution Company), a MFA Distributor, the Superflea Flea Market, Tucker's Flea Market, a portion of a concrete mixing facility, and some pastureland (Maxim 2003, KDHE 2005). The facility is bordered on the north by residential properties; on the east by the East Iola Site (the location of the former Prime Western Smelting Company Works No. 3 and J.B. Kirk Gas and Smelting Company), a car wash, a former Tyson processing facility, and a movie theater; on the south by a restaurant, a dry cleaner, a car dealership, and agricultural land; and on the west by the Colberly Site (the location of the former United Iron Works Company), a truck repair facility, and the remaining portion of the concrete mixing facility (Maxim 2003). The facility is also surrounded by residential neighborhoods and two schools (KDHE 2005). The Iola Preschool for the Exceptional (Iola Preschool) is located northeast of United Zinc, and the McKinley Elementary School (McKinley School) is located southwest of United Zinc (Terranext 2005). The facility layout is shown in Appendix A, Figure 2.

2.3 OPERATIONAL HISTORY

According to the historic plat maps and Sanborn fire insurance maps, activities at the United Zinc facility began as early as 1901. At that time, the facility was called the Standard Acid Company and included three furnaces, 12 retorts, and a pottery room with kilns. Mr. William Lanyon owned the property between 1901 and 1902. The property was transferred to United Zinc in 1902. United Zinc and Chemical Company owned and operated the primary zinc smelter until approximately 1912. No known active smelting facilities were

documented on the property after 1912. Historical documentation indicates that the United Zinc facility contained four furnaces, eight kilns, 14 retorts, and several ore crushers and roasters (KDHE 2005). The United Zinc facility was designed to capture the sulfur dioxide fumes generated during roasting the ore to make sulfuric acid; therefore, United Zinc likely utilized the acid chambers associated with the Standard Acid facility (KDHE 2006).

During a 2003 Phase I site reconnaissance, smelter waste was observed at United Zinc, and the quantity was estimated as approximately 1,800 cubic yards concentrated in the southwest corner of the vacant property at United Zinc (Burns & McDonnell Engineering Company Inc. [Burns & McDonnell] 2004, Terranext 2005). Zinc smelter waste is known to contain elevated concentrations of heavy metals from smelting activities—including arsenic, cadmium, lead, and zinc. Sampling of the soil, groundwater, sediment, surface water, smelter waste, and surrounding areas began in 2004 to determine the potential impact from the former smelting operations at United Zinc. Additional sampling was conducted in March of 2007 to identify background levels of arsenic and lead in the soil near the site, collect surface water and sediment samples from areas where runoff drains from the site, and to collect surface water from the surface water intake in the Neosho River that provide the drinking water supply to the residents of Iola. The results are discussed in Section 3.2.

2.4 REGULATORY INVOLVEMENT

Requests for information were made to agencies possibly involved with United Zinc. A summary of involvement by these agencies is as follows.

2.4.1 Kansas Department of Health and Environment

A Phase I Focused Former Smelter Assessment (FFSA) was completed on behalf of the KDHE State Water Plan (SWP) program in December 2003. The FFSA identified a Recognized Environmental Condition (REC) at United Zinc based on observation of smelter waste during the site reconnaissance. The smelter waste appeared to have impacted the vegetative growth in the area of the former smelter operations. In addition, elevated concentrations of lead had been previously documented in the surface soils on the property immediately adjacent to United Zinc from other documented smelting operations, including the East Iola Site and the Colberly Site. A Phase II Assessment was recommended at United Zinc and in the area surrounding the smelting activities to investigate the potential risk of human exposure to heavy metal-impacted waste and surface soil (Maxim 2003).

Sampling of the soil, smelter waste, groundwater, surface water, and sediment was conducted during the Phase II FFSA at United Zinc in December 2004 on behalf of the KDHE SWP. The sampling identified

elevated levels of arsenic, cadmium, lead, and zinc above the background soil sample concentrations. The Phase II FFSA also indicated potential contamination near residents and at both the McKinley School and the Iola Preschool (Burns & McDonnell 2004, KDHE 2005).

KDHE collected samples in June 2005 from 50 residential yards located between United Zinc and the McKinley School and the Iola Preschool. Arsenic was detected above its KDHE RSK Residential Soil Pathway level of 11 milligrams per kilogram (mg/kg) in 18 of the residential samples (Terranext 2005, KDHE 2003). In addition, lead was found above its KDHE RSK Residential Soil Pathway level of 800 mg/kg in 12 of the residential samples, some of the same samples with elevated arsenic concentrations. Cadmium and zinc were detected in all of the soil samples at concentrations below their KDHE RSK Residential Soil Pathway values (Terranext 2005, KDHE 2003, 2005).

A preliminary removal site evaluation (RSE) was conducted by KDHE in September 2005. In support of the 2005 RSE, KDHE collected additional samples from sensitive receptors areas near United Zinc, including the McKinley School and Iola Preschool. The results exhibited elevated levels of arsenic, cadmium, lead, and zinc at residential and non-residential properties. The presence of lead above 400 mg/kg was also identified within the McKinley School playground and adjacent areas. The Preliminary RSE recommended further removal site evaluation and removal action consideration (KDHE 2005).

2.4.2 U.S. Environmental Protection Agency

Tetra Tech, under contract to the EPA, prepared a RSE report in September 2006. The sampling activities for the RSE were conducted during April and May 2006. During the RSE, approximately 260 properties were screened for lead using a XRF, and approximately 10 percent of the screened samples were submitted for laboratory confirmation analyses of arsenic, barium, cadmium, lead, and zinc. Thirty-four properties were identified where either the XRF and/or laboratory data indicated lead concentrations warranted a time-critical removal action (400 mg/kg for schools and daycares; 800 mg/kg for residential properties; and 1,000 mg/kg for commercial properties). The 34 properties included 19 private residences, 10 daycare facilities, two elementary schools, and three commercial properties. In addition, 91 residential properties contained concentrations of lead between 400 mg/kg and 800 mg/kg (Tetra Tech 2006a).

In February 2007 a PA report was completed. It summarized the sampling activities conducted at United Zinc from August to November 2006. During the PA activities, approximately 500 residential properties were screened for lead using a XRF and 180 soil samples were submitted for laboratory confirmatory analyses of arsenic, cadmium, lead and zinc. The laboratory results found arsenic detected in 160 of the confirmatory soil samples at concentrations exceeding its Superfund Chemical Data Matrix (SCDM) Cancer Risk (CR) screening concentration of 0.43 mg/kg. In addition, 32 of those samples had concentrations that

exceeded the SCDM Reference Dose (RfD) screening concentration of 23 mg/kg for arsenic (EPA 2004). The background concentrations of arsenic ranged from 8 mg/kg to 13 mg/kg. Barium and zinc were detected in all the soil samples at concentrations below their SCDM RfD screening concentrations of 5,500 mg/kg and 23,000 mg/kg, respectively (EPA 2004). Cadmium was detected in one soil sample at a concentration of 45.4 mg/kg, which exceeds its RfD screening concentration. The remaining soil samples contained concentrations of cadmium below its RfD screening concentration of 39 mg/kg (EPA 2004). In June 2007 KDHE updated the Risk-Based Standards for Kansas Manual and the Residential Soil Pathway value for lead was decreased to 400 mg/kg (KDHE 2007a). A total of 148 soil samples analyzed by the laboratory during the PA contained lead concentrations exceeding the KDHE RSK Residential Soil Pathway value of 400 mg/kg. All of these samples also exceeded lead background concentrations defined during the PA that ranged from 176 mg/kg to 397 mg/kg (Tetra Tech 2007a).

It was unclear if the background samples collected during the PA were contaminated with lead or if the concentrations detected were representative of background concentrations of lead in soil in the area. Additional samples were recommended to be collected north of the facility to identify and verify site-specific background concentrations of lead in the soil.

United Zinc was not listed in the Resource Conservation and Recovery Information System (RCRIS) database as of February 7, 2007 (EPA 2007b).

3.0 INVESTIGATIVE EFFORTS

Section 3.0 discusses historical investigations, as well as the current PA field sampling and quality assurance (QA)/quality control (QC) activities performed at United Zinc.

3.1 PREVIOUS SAMPLING

This section describes previous sampling in addition to that conducted at United Zinc, which was discussed in Section 2.4.2 above.

3.1.1 Smelter Waste Sampling

Smelter waste was sampled from four locations at United Zinc during the Phase II FFSA. The smelter waste was field screened using the XRF, and one of the four samples was submitted to the laboratory for arsenic, cadmium, lead, and zinc analyses. The field screening results identified concentrations of arsenic, cadmium, lead, and zinc above their respective KDHE RSK values, and the laboratory data confirmed concentrations of arsenic and lead above their respective KDHE RSK values (Burns & McDonnell 2004).

3.1.2 Soil Sampling

During the Phase II FFSA, the surface soil was screened and sampled on and off the former United Zinc property. The soil samples were screened in the field with a portable XRF, and a portion of the samples were submitted to a laboratory for analyses for arsenic, cadmium, lead, and zinc. In the surface soil samples collected on site at the United Zinc property, all four metals were detected at levels exceeding their respective KDHE RSK values. For the soil samples collected off the United Zinc property: (1) the XRF field screening identified concentrations of arsenic, cadmium, and lead above their respective KDHE RSK values; and (2) results of laboratory confirmatory analyses indicted that only arsenic and lead exceeded their respective KDHE RSK values (Burns & McDonnell 2004).

In addition, three direct-push borings were installed and sampling from them occurred during the Phase II FFSA. The borings were screened in the field with the XRF, and the sample from each borehole exhibiting the highest concentration of metals was submitted for laboratory analyses for arsenic, cadmium, lead, and zinc. According to both the field screening and the laboratory data, the soil samples collected from the borings contained concentrations of arsenic, cadmium, and lead exceeding their respective KDHE RSK values (Burns & McDonnell 2004).

Surface soils from four sensitive receptor areas near the McKinley School and Iola Preschool were screened in-situ with the portable XRF during the FFSA. The XRF field screening results detected cadmium and lead above their respective KDHE RSK values. Laboratory confirmatory results identified concentrations of arsenic and lead exceeding their respective KDHE RSK values in soil samples from those areas (Burns & McDonnell 2004).

KDHE collected additional soil sampling in June 2005 from 50 randomly selected residential yards between United Zinc and two sensitive receptors, the McKinley School and Iola Preschool—from a depth interval of 1 to 3 inches below ground surface (bgs). The soil samples were submitted for analyses for arsenic, cadmium, lead, and zinc. Arsenic was detected above its RSK value, specifically north of United Zinc along Willow Drive and south of United Zinc at the intersection of Madison Street and Tennessee Street. Lead was detected in all of the soil samples, ranging from 51.2 mg/kg to 1,800 mg/kg. Eighteen of the surface soil samples contained concentrations of lead exceeding its RSK value, and the highest concentrations identified were located at the northwest corner of the Willow Drive and Vermont Street intersection and along Ohio Street south of the United Zinc facility. Cadmium and zinc were detected in all of the soil samples, but below the RSK values for these contaminants (Terranext 2005).

The purpose of the Preliminary RSE was to obtain additional sampling data from sensitive receptor areas around the McKinley School and Iola Preschool. Surface soil samples were collected in a grid formation and were screened on site with a XRF for lead; six of the samples were sent to a laboratory for confirmation analyses. The results found lead concentrations exceeding 400 mg/kg on the McKinley School playground, generally linear and parallel to the streets within 10-15 feet of the fence surrounding the school (KDHE 2005).

During the RSE, 34 properties were identified where the XRF and/or laboratory data indicated lead concentrations warranted a time-critical removal action (400 mg/kg for schools and daycares, 800 mg/kg for residential properties, and 1,000 mg/kg for commercial properties). In addition, 91 residential properties contained concentrations of lead between 400 mg/kg and 800 mg/kg (Tetra Tech 2006a).

The PA sampling activities conducted during August to November 2006 identified 148 residential soil samples with lead concentrations exceeding the KDHE RSK Residential Soil Pathway value of 400 mg/kg and are summarized in Table 1 (Tetra Tech 2007a).

TABLE 1

SUMMARY OF LABORATORY LEAD CONCENTRATIONS EXCEEDING KDHE RSK RESIDENTIAL SOIL PATHWAY VALUE
UNITED ZINC NO. 1, IOLA, KANSAS
AUGUST-NOVEMBER 2006

Sample Number	EPA Property ID	Date Collected	Lab Result (mg/kg)
3151-1	EPA #270, Cell 2	08/15/2006	552
3151-2	EPA #64, Cell 1	08/08/2006	907
3151-3	EPA #102, Cell 2	08/08/2006	631
3151-4	EPA #76, Cell 3	08/08/2006	817
3151-5	EPA #183, Cell 1	08/08/2006	1,440
3151-6	EPA #261, Cell 1	08/09/2006	805
3151-7	EPA #266, Cell 1	08/09/2006	1,660
3151-9	EPA #268, Cell 2	08/09/2006	647
3152-1	EPA #254, Cell 1	08/19/2006	946
3152-2	EPA #285, Cell 2	08/21/2006	991
3152-3	EPA 298, Cell 1	08/22/2006	782
3152-4	EPA #295, Cell 1	08/22/2006	1,200
3152-5	EPA #274, Cell 2	08/16/2006	1,640
3152-6	EPA #3, Cell 7	08/16/2006	838
3152-7	EPA #297, Cell 1	08/23/2006	1,140
3152-8	EPA #299, Cell 2	08/24/2006	1,130
3152-10	EPA #287, Cell 1	08/25/2006	518
3152-11	EPA #281, Cell 1	08/28/2006	541
3152-12	EPA #328, Cell 4	08/29/2006	1,050
3152-13	EPA #334, Cell 1	08/29/2006	1,050
3152-14	EPA #325, Cell 1	08/30/2006	1,010
3152-15	EPA #326, Cell 3	08/30/2006	582

TABLE 1 (Continued)

SUMMARY OF LABORATORY LEAD CONCENTRATIONS EXCEEDING KDHE RSK RESIDENTIAL SOIL PATHWAY VALUE
UNITED ZINC NO. 1, IOLA, KANSAS
AUGUST-NOVEMBER 2006

Sample Number	EPA Property ID	Date Collected	Lab Result (mg/kg)
3152-16	EPA #294, Cell 1	08/30/2006	996
3152-17	EPA #309, Cell 2	08/30/2006	2,010
3152-19	EPA #314, Cell 3	08/31/2006	1,270
3152-20	EPA #315, Cell 1	08/31/2006	600
3153-1	EPA #373, Cell 1	09/06/2006	412
3153-4	EPA #392, Cell 1	09/11/2006	460
3153-5	EPA #333, Cell 1	09/11/2006	566
3153-7	EPA #344, Cell 2	09/12/2006	504
3153-8	EPA #346, Cell 2	09/12/2006	420
3153-10	EPA #356, Cell 1	09/12/2006	484
3153-11	EPA #255, Cell 1	09/12/2006	738
3153-12	EPA #354, Cell 1	09/13/2006	406
3153-13	EPA #14, Cell 3	09/14/2006	1,690
3153-14	EPA #394, Cell 1	09/14/2006	523
3153-15	EPA #337, Cell 1	09/14/2006	699
3153-16	EPA #378, Cell 2	09/15/2006	1,050
3153-17	EPA #341, Cell 1	09/15/2006	515
3154-2	EPA #414, Cell 4	09/18/2006	593
3154-3	EPA #408, Cell 3	09/19/2006	635
3154-4	EPA #396, Cell 1	09/19/2006	509
3154-6	EPA #558, Cell 2	09/25/2006	761
3154-7	EPA #65, Cell 2	09/25/2006	1,480
3154-8	EPA #541, Cell 2	09/25/2006	568
3154-9	EPA #411, Cell 1	09/27/2006	1,280
3154-10	EPA #397, Cell 3	09/16/2006	1,390
3154-11	EPA #452, Cell 5	09/20/2006	1,380
3154-12	EPA #467, Cell 4	09/20/2006	857
3154-13	EPA #467, Cell 2	09/20/2006	1,040
3154-14	EPA #434, Cell 1	09/21/2006	916
3154-15	EPA #463, Cell 2	09/21/2006	1,140
3154-16	EPA #404, Cell 1	09/21/2006	748
3154-17	EPA #433, Cell 1	09/21/2006	719
3154-18	EPA #406, Cell 1	09/21/2006	449
3154-22	EPA #547, Cell 4	09/26/2006	581
3154-23	EPA #387, Cell 3	09/26/2006	461
3154-25	EPA #565, Cell 1	09/26/2006	1,410
3154-26	EPA #579, Cell 2	09/27/2006	1,500
3154-27	EPA #579, Cell 4	09/27/2006	839
3154-28	EPA #567, Cell 5	09/27/2006	1,190
3154-29	EPA #554, Cell 3	09/27/2006	916
3154-30	EPA #588, Cell 1	09/28/2006	970
3154-31	EPA #588, Cell 3	09/28/2006	1,690
3154-32	EPA #593, Cell 1	09/28/2006	2,520
3154-33	EPA #591, Cell 2	09/28/2006	1,230
3154-34	EPA #468, Cell 2	09/28/2006	1,010
3154-35	EPA #532, Cell 2	09/29/2006	1,920
3155-3	EPA #515, Cell 1	10/03/2006	683

TABLE 1 (Continued)

SUMMARY OF LABORATORY LEAD CONCENTRATIONS EXCEEDING KDHE RSK RESIDENTIAL SOIL PATHWAY VALUE
UNITED ZINC NO. 1, IOLA, KANSAS
AUGUST-NOVEMBER 2006

Sample Number	EPA Property ID	Date Collected	Lab Result (mg/kg)
3155-4	EPA #514, Cell 1	10/03/2006	908
3155-5	EPA #625, Cell 1	10/04/2006	993
3155-6	EPA #234, Cell 3	10/04/2006	796
3155-8	EPA #610, Cell 1	10/04/2006	676
3155-9	EPA #607, Cell 1	10/04/2006	1,410
3155-10	EPA #659, Cell 1	10/05/2006	785
3155-11	EPA #234, Cell 2	10/05/2006	6,430
3155-12	EPA #6010	10/05/2006	1,060
3155-13	EPA# 664, Cell 1	10/05/2006	759
3155-14	EPA #662, Cell 3	10/05/2006	1,250
3155-15	EPA #621, Cell 1	10/06/2006	1,870
3155-16	EPA #553, Cell 6	10/06/2006	507
3155-17	EPA #658, Cell 1	10/09/2006	3,810
3155-18	EPA #720, Cell 1	10/10/2006	701
3155-19	EPA #710, Cell 5	10/10/2006	789
3155-26	EPA #725, Cell 1	10/12/2006	482
3155-27	EPA #717, Cell 1	10/12/2006	764
3155-31	EPA #694, Cell 1	10/12/2006	521
3155-33	EPA #699, Cell 2	10/13/2006	794
3156-1	EPA #729, Cell 1	10/16/2006	731
3156-2	EPA #771, Cell 3	10/16/2006	3,620
3156-3	EPA #748, Cell 1	10/16/2006	458
3156-4	EPA #739, Cell 2	10/16/2006	1,260
3156-5	EPA #755, Cell 4	10/17/2006	1,230
3156-7	EPA #746, Cell 1	10/17/2006	588
3156-8	EPA #753, Cell 1	10/17/2006	680
3156-10	EPA #775, Cell 2	10/17/2006	1,410
3156-11	EPA #621, Cell 4	10/18/2006	466
3156-12	EPA #781, Cell 1	10/18/2006	515
3156-13	EPA #647, Cell 4	10/18/2006	420
3156-14	EPA #632, Cell 3	10/18/2006	746
3156-15	EPA #648, Cell 2	10/18/2006	1,360
3156-16	EPA #651, Cell 3	10/18/2006	1,780
3156-17	EPA #589, Cell 4	10/18/2006	1,360
3156-18	EPA #759, Cell 4	10/19/2006	1,570
3156-19	EPA #443, Cell 1	10/19/2006	3,110
3156-20	EPA #692, Cell 1	10/19/2006	1,470
3156-21	EPA #613, Cell 4	10/29/2006	3,070
3156-22	EPA #400, Cell 4	10/19/2006	1,360
3156-23	EPA #621, Cell 2	10/19/2006	842
3156-24	EPA #793, Cell 3	10/20/2006	831
3156-25	EPA #750, Cell 1	10/19/2006	861
3156-26	EPA #810, Cell 4	10/29/2006	774
3156-27	EPA #446, Cell 3	10/20/2006	921
3156-28	EPA #764, Cell 2	10/23/2006	559
3156-29	EPA #417, Cell 1	10/24/2006	2,270
3156-30	EPA #796, Cell 1	10/24/2006	1,050

TABLE 1 (Continued)

SUMMARY OF LABORATORY LEAD CONCENTRATIONS EXCEEDING KDHE RSK RESIDENTIAL SOIL PATHWAY VALUE UNITED ZINC NO. 1, IOLA, KANSAS AUGUST-NOVEMBER 2006

Sample Number	EPA Property ID	Date Collected	Lab Result (mg/kg)
3156-32	EPA #806, Cell 1	10/24/2006	2,100
3156-33	EPA #787, Cell 1	10/24/2006	825
3156-34	EPA #786, Cell 1	10/25/2006	599
3156-35	EPA #500, Cell 2	10/25/2006	503
3156-37	EPA #853, Cell 1	10/26/2006	529
3157-1	EPA #525, Cell 4	10/30/2006	2,040 J
3157-2	EPA #526, Cell 2	10/30/2006	662
3157-3	EPA #480, Cell 2	10/31/2006	824
3157-4	EPA #544, Cell 1	10/31/2006	726
3157-5	EPA #877, Cell 1	10/31/2006	542
3157-6	EPA #408, Cell 2	10/31/2006	8,390
3157-7	EPA #883, Cell 2	11/01/2006	871
3157-8	EPA #844, Cell 2	11/01/2006	748
3157-9	EPA #862, Cell 1	11/01/2006	505
3157-10	EPA #833, Cell 1	11/02/2006	674
3157-12	EPA #813, Cell 1	11/02/2006	950
3157-13	EPA #887, Cell 2	11/03/2006	1,120
3157-14	EPA #505, Cell 1	11/06/2006	1,520
3157-15	EPA #611, Cell 3	11/06/2006	3,980
3157-16	EPA #668, Cell 2	11/07/2006	665
3157-17	EPA #907, Cell 1	11/08/2006	687
3157-18	EPA #919, Cell 3	11/09/2006	1,320
3158-1	EPA #927, Cell 2	11/13/2006	2,640
3158-2	EPA #931, Cell 2	11/15/2006	1,260
3158-3	EPA #965, Cell 1	11/17/2006	426
3158-4	EPA #982, Cell 1	11/21/2006	483
3158-5	EPA #975, Cell 2	NA	1,150
3158-6	EPA #950, Cell 2	11/27/2006	526
3158-8	EPA #968, Cell 5	11/27/2006	940
3158-9	EPA #957, Cell 3	11/28/2006	1,620
3158-10	EPA #958, Cell 2	11/28/2006	5,550
3158-11	EPA #998, Cell 1	11/29/2006	961

Notes:

EPA	United States Environmental Protection Agency
ID	Identification
J	Identification of the analyte is acceptable; the reported value is an estimate
mg/kg	Milligrams per kilogram
NA	Not available
#	Number

3.1.3 Groundwater Sampling

Following the collection of soil cores from the direct-push borings during the Phase II FFSA, temporary piezometers were installed in the boreholes. Groundwater samples were collected from three piezometers, and were field filtered and submitted for analyses for arsenic, cadmium, lead, and zinc. Cadmium was detected in two of the groundwater samples at concentrations of 0.0068 milligrams per liter (mg/L) and 0.073 mg/L, and lead was detected in one groundwater sample at a concentration of 0.05 mg/L. The concentrations of both the cadmium and lead detected in the groundwater samples exceeded their respective KDHE RSK values (Burns & McDonnell 2004). In addition, the cadmium concentrations detected in the two groundwater samples discussed above exceeded the maximum contaminant level (MCL) of 0.005 mg/L for cadmium, and the lead concentration detected exceeded the action level of 0.015 mg/L for lead (EPA 2004).

3.1.4 Surface Water and Sediment Sampling

During the Phase II FFSA, two surface water and sediment samples were collected south of the United Zinc facility along a tributary to Rock Creek. The sediment samples were screened in the field with the XRF. One of the sediment samples and both surface water samples were submitted to the laboratory for analyses for arsenic, cadmium, lead, and zinc. The only metal detected above its KDHE RSK value was arsenic in the two sediment samples—at concentrations of 6.6 mg/kg and 6.2 mg/kg. No other metal was detected above its KDHE RSK value in either the surface water or sediment samples (Burns & McDonnell 2004).

3.2 SI SAMPLING

In March 2007, Tetra Tech in support of EPA conducted additional sampling to help identify site-specific background levels of arsenic and lead in the soil, collect surface water and sediment samples from areas where runoff drains from the site, and to collect surface water samples from the surface water intake along the Neosho River that provide the drinking water supply to the residents of Iola. Tetra Tech prepared a site-specific Quality Assurance Project Plan (QAPP) for United Zinc. The QAPP was approved by EPA subsequent its submission at the beginning of March 2007 (Tetra Tech 2006b). Field activities were conducted in accordance with the approved QAPP. Samples for Analytical Services Request (ASR) 3396 were hand delivered to the EPA Region 7 laboratory. Field sheets, chain-of-custody records, and the notes record in the logbook are in Appendix B, and the complete validated analytical results are in Appendix C. The data were validated by EPA Region 7 Quality Assurance personnel. Sampling methodologies, locations, analyses, and analytical results for the SI activities are summarized below in Section 3.2.3.

3.2.1 Soil Sampling

The purpose of collection of additional soil samples during the SI was to identify site-specific background concentrations of arsenic and lead in an area not impacted by the former smelting processes of United Zinc. The sampling locations were selected from a residential neighborhood 1.25 mile north of United Zinc facility boundary. The sample locations are summarized in Table 2. The screening process delineated each residential property selected for screening into at least four cells. The cells radiated out 100 feet from the drip zone around the house or until the property line was reached, whichever was less. The maximum size of each cell was 100 feet by 100 feet. Additional areas or cells that were screened include the drop zone; fine-grained material if used in driveways, sidewalks, or under carports; vegetable gardens; and children's play areas that were at least 25 feet by 25 feet. A composite sample consisting of nine aliquots, each collected from 0 to 2 inches bgs, was collected from each cell and placed in a labeled, sealed plastic bag. All samples were transported to the sample preparation facility and placed in clean, dedicated aluminum pie pans. The samples were dried completely, homogenized, passed through a sieve, and then screened for lead using a XRF. An average of three readings were calculated and recorded on the residential property screening forms (see Appendix D). All five of the residential screened soils samples were submitted to the EPA Region 7 laboratory for confirmation analyses for arsenic and lead. Locations of the samples submitted to the laboratory are illustrated on Figure 3 (see Appendix A).

TABLE 2

BACKGROUND SOIL SAMPLE SUMMARY
UNITED ZINC NO. 1, IOLA, KANSAS
MARCH 2007

EPA Sample Number	Location	Depth (ft bgs)	Sample Date	Sample Time
3396-1	118 Cardinal Drive	0-2	03/19/07	13:00
3396-2	218 Cardinal Drive	0-2	03/19/07	13:35
3396-3	1010 Dewitt Drive	0-2	03/19/07	14:00
3396-4	1002 Dewitt Drive	0-2	03/19/07	14:15
3396-5	720 Dewitt Drive	0-2	03/19/07	14:33

Notes:

EPA U.S. Environmental Protection Agency ft bgs Feet below ground surface

Each soil sample was collected in one 8-ounce jar. Samples were placed into a cooler containing ice, where they were stored at a temperature at or below 4 degrees Celsius (°C) pending submittal to the EPA Region 7 laboratory.

Analytical Data Summary

Table 3 summarizes the analytical results for the background soil samples. Arsenic was detected in two of the five residential background soil samples ranging from 5.09 mg/kg to 7.22 mg/kg. All of the background sample concentrations exceeded the arsenic CR screening concentration of 0.43 mg/kg but below the arsenic RfD screening concentration of 23 mg/kg (EPA 2004). The background concentrations of arsenic identified during the PA sampling activities were slightly higher than the SI results and ranged from 8 mg/kg to 13 mg/kg (Tetra Tech 2007a). The concentrations of arsenic detected in the background soil samples during the SI appear to be naturally occurring since the average arsenic concentration documented in Allen County by the USGS is 9.8 mg/kg (USGS 2007).

Lead was detected in all five of the residential background soil samples and the concentrations ranged from 21.0 mg/kg to 122 mg/kg as shown in Table 3. All the lead concentrations detected in the background samples were well below the KDHE RSK Residential Soil Pathway value of 400 mg/kg. The background concentrations of lead identified during the PA sampling activities ranged from 176 mg/kg to 397 mg/kg (Tetra Tech 2007a), but the documented average lead concentration for soil in Allen County according to the USGS is 27.2 mg/kg (USGS 2007). The background levels of lead near the former United Zinc facility identified during the SI are higher than the documented county average of 27.2 mg/kg but below the concentrations previously identified as background concentrations in the PA. Therefore, it appears that the background locations identified during the PA was impacted by the operational history of the site and not representative of true background levels.

TABLE 3

ANALYTICAL DATA FOR BACKGROUND SOIL SAMPLES
UNITED ZINC NO. 1, IOLA, KANSAS
MARCH 2007

Analyte	Benchmarks (mg/kg)		KDHE RSK Residential Soil Pathway Value (mg/kg)	Sample ID and Results (mg/kg)				
	RfD	CR		3396-1	3396-2	3396-3	3396-4	3396-5
Arsenic	23	0.43	11	**4.17 U**	**4.42 U**	**5.09**	**3.89 U**	**7.22**
Lead	NE	NE	400	41.7	122	25.3	21.0	52.0

Notes:

Bold indicates a concentration that exceeds a benchmark value

CR Cancer risk screening concentration from SCDM
ID Identification
mg/kg Milligrams per kilogram
NE Not established
KDHE Kansas Department of Health and Environment
RfD Reference dose screening concentration from SCDM
RSK Risk-Based Standards for Kansas
SCDM Superfund Chemical Data Matrix (EPA 2004)
U The analyte was not detected at or above the reporting limit.

3.2.2 Groundwater Sampling

Although the primary source of drinking water for the City of Iola is surface water, groundwater samples were proposed to be collected from five private drinking water wells including one background well during the SI (EPA 2007a). According to the Kansas Geological Survey (KGS) database, approximately 109 registered wells are within 4 miles of the former United Zinc facility; however, only eight domestic wells are listed as active (KGS 2007). The private drinking water wells proposed to be sampled were selected from the active wells identified in the KGS database. Only the background private well was sampled during the SI activities due to inability to obtain access or to locate the wells using the locational information provided in the KGS database. This well is actively used for lawn care and for an ornamental pond that contains fish. The groundwater sample was collected from a tap/spigot located nearest the well head, prior to any treatment system. The system lines were purged for approximately 5 minutes before the sample was collected. Water quality parameters (pH, conductivity, and temperature) were measured and the sample was collected after the parameters stabilized.

The groundwater sample was submitted to the laboratory for analysis of arsenic and lead. The samples was collected directly into a 1-liter container preserved with nitric acid to a pH <2 from the tap/spigot. The sample was placed into a cooler containing ice, where they were stored at a temperature at or below 4 degrees °C pending submittal to the EPA Region 7 laboratory.

Analytical Data Summary

Neither arsenic nor lead was detected in the background groundwater sample collected from the private well located on East Garfield Road in Iola.

3.2.3 Surface Water and Sediment Sampling

The purpose of collecting surface water and sediment samples from the natural drainage areas during the SI was to determine if a release of contaminants has occurred from the former United Zinc facility to nearby creeks. Surface water runoff from United Zinc drains into Rock Creek, which is located approximately 0.25 to 0.5 mile east/southeast of the former smelter property. Rock Creek drains into Elm Creek which drains into the Neosho River; the confluence of Rock Creek and Elm Creek is located approximately 0.75 mile due south of the United Zinc facility. The confluence of Elm Creek and the Neosho River is about 1.5 mile west/southwest of the facility. During the SI surface water and sediment samples were collected from Rock Creek southeast of the facility and from Elm Creek southwest of the facility as illustrated on Figure 3 (see Appendix A) and detailed in Table 4.

TABLE 4

SEDIMENT AND SURFACE WATER SAMPLE SUMMARY
UNITED ZINC NO. 1, IOLA, KANSAS
MARCH 2007

EPA Sample Number	Location	Sample Date	Sample Time
3396-6 / 3396-101	Background sample located in Rock Creek north of Highway 54 west of Road 1800	03/20/07	09:45
3396-7 / 3396-102	Background Sample located on Elm Creek south of NE Road on west of Highway 169	03/20/07	09:15
3396-8 / 3396-103	Rock Creek south of Highway 54 west of Highway 169	03/20/07	09:31
3396-9 / 3396-104	Rock Creek east of 10th Street south of Clarence Street	03/20/07	10:06
3396-10 / 3396-105	Elm Creek south end of Kentucky Street	03/20/07	10:20
3396-11 / 3396-106	Elm Creek south end of Colborn Street	03/20/07	10:53

Notes:

EPA U.S. Environmental Protection Agency

The sediment samples were submitted to the EPA Region 7 laboratory for analysis of arsenic and lead. Sediment samples were collected from the top 6 inches of the stream sediment with a disposable stainless-steel spoon. The sediment was placed in a disposable aluminum pie pan for homogenization and then transferred to an 8-ounce jar. Samples were placed into a cooler containing ice, where they were stored at a temperature at or below 4 degrees °C pending submittal to the EPA Region 7 laboratory.

Analytical Data Summary

Table 5 summarizes the analytical results for the sediment samples collected during the SI. Arsenic was detected in two of the sediment samples at concentrations ranging from 4.48 mg/kg to 27.3 mg/kg. Lead was detected in all six of the sediment samples including the background sample. The concentrations of lead detected in the sediment samples ranged from 27.2 mg/kg to 1,100 mg/kg. Based on the lead concentrations, a segment of actual contamination was established between sediment samples 3396-9 and 2296-11 starting in Rock Creek and leading into Elm Creek because they exceeded three times the background concentration of 81.6 mg/kg.

TABLE 5

ANALYTICAL DATA FOR SEDIMENT SAMPLES
UNITED ZINC NO. 1, IOLA, KANSAS
MARCH 2007

Analyte	KDHE RSK Non-Residential Soil Pathway Value (mg/kg)	Sample ID and Results (mg/kg)					
		3396-6 (bkgd)	3396-7 (bkgd)	3396-8	3396-9	3396-10	3396-11
Arsenic	48	2.57 U	4.48	1.98 U	27.3	2.12 U	3.24 U
Lead	1,000	27.2	56.2	57.2	**1,100**	144	163

Notes:

Highlighted cells indicates a concentration that exceeds three times the background concentration
Bold indicates a concentration that exceeds the KDHE RSK Non-Residential Soil Pathway Value

bkgd Background
ID Identification
KDHE Kansas Department of Health and Environment
mg/kg Milligrams per kilogram
RSK Risk-Based Standards for Kansas
U The analyte was not detected at or above the reporting limit

Surface water samples were submitted to the EPA Region 7 laboratory for analysis of arsenic and lead. At each location, the surface water samples were collected prior to the collection of the sediment sample. Water samples were collected by immersing a 1-liter container preserved with nitric acid to a pH <2 directly into the water. Samples were placed into a cooler containing ice, where they were stored at a temperature at or below 4 degrees °C pending submittal to the EPA Region 7 laboratory.

Analytical Data Summary

Arsenic was not detected in any of the surface water samples collected during the SI, and lead was only detected in sample 3396-104 at a concentration of 16.8 µg/L. The concentration of lead detected in the surface water sample from Rock Creek was below the SCDM environmental acute criteria maximum concentration (CMC) and the chronic criteria continuous concentration (CCC) for fresh water as shown in Table 6.

TABLE 6

ANALYTICAL DATA FOR SURFACE WATER SAMPLES
UNITED ZINC NO. 1, IOLA, KANSAS
MARCH 2007

Analyte	Environmental Benchmarks (µg/L)		Sample ID and Results (µg/L)					
	Acute CMC	Chronic CCC	3396-101 (bkgd)	3396-102	3396-103	3396-104	3396-105	3396-106
Arsenic	340	150	10 UJ	10 UJ	10 UJ	10 UJ	10 UJ	10 UJ
Lead	65	2.5	10 UJ	10 UJ	10 UJ	16.8 J	10 UJ	10 UJ

Notes:

bkgd Background
CCC Criteria continuous concentration
CMC Criteria maximum concentration
ID Identification
J The identification of the analyte is acceptable; the reported value is an estimate.
µg/L micrograms per liter
UJ The analyte was not detected at or above the reporting limit. The reporting limit is an estimate.

3.2.4 Surface Water Intake Sampling

As part of the SI surface water samples were collected from three locations along the Neosho River including one background sample located upgradient of the surface water intake. The purpose of collecting these surface water samples was to determine if the drinking water source for the City of Iola was impacted by the former United Zinc facility. The surface water samples collected from the Neosho River are detailed in Table 7. The surface water samples were submitted to the EPA Region 7 laboratory for analysis of arsenic and lead. Water samples were collected by immersing a 1-liter container preserved with nitric acid to a pH <2 directly into the water. Samples were placed into a cooler containing ice, where they were stored at a temperature at or below 4 degrees °C pending submittal to the EPA Region 7 laboratory.

TABLE 7

SURFACE WATER SAMPLE SUMMARY
UNITED ZINC NO. 1, IOLA, KANSAS
MARCH 2007

EPA Sample Number	Location	Sample Date	Sample Time
3396-201	Collected from Neosho River near surface water intake	03/21/07	09:48
3396-202	Collected from boat ramp on Neosho River upstream of surface water intake	03/21/07	09:53
3396-203	Background sample collected from Neosho River	03/21/07	10:13

Notes:

EPA U.S. Environmental Protection Agency

Analytical Data Summary

Arsenic was not detected in the surface water samples collected near the surface water intake, but was detected in the background surface water sample at a concentration of 4.38 µg/L. Lead was detected at low levels in all three surface water samples but the highest concentration (6.45 µg/L) was detected in the background surface water sample. The surface water intake sample results are summarized in Table 8.

TABLE 8

ANALYTICAL DATA FOR SURFACE WATER INTAKE SAMPLES
UNITED ZINC NO. 1, IOLA, KANSAS
MARCH 2007

Analyte	Drinking Water Benchmarks (µg/L)			Sample ID and Results (µg/L)		
	MCL	Reference Dose Concentrations	CR	3396-201	3396-202	3396-203 (bkgd)
Arsenic	10	11	0.057	2.96 U	2.76 U	4.38
Lead	15	NA	NA	2.25	1.95	6.45

Notes:

bkgd Background
MCL Maximum Contaminant Levels
CR Cancer Risk Concentrations
ID Identification
NA Not Available
µg/L Milligrams per kilogram
U The analyte was not detected at or above the reporting limit

4.0 HAZARD RANKING SYSTEM FACTORS

This section discusses the sources of contamination and the contaminant migration pathways evaluated under the Hazard Ranking System.

4.1 SOURCES OF CONTAMINATION

Sources of hazardous substances associated with the facility include, but may not be limited to:

- Pile – At least four separate piles of smelter waste were identified during the FFSA site reconnaissance. The quantity of smelter waste observed at United Zinc was estimated as approximately 1,800 cubic yards, and was concentrated in the southwest corner of the vacant property at United Zinc (Burns & McDonnell 2004, Terranext 2005). The smelter waste was sampled from each pile during the Phase II FFSA at United Zinc. The piles were field screened using the XRF, and one of the four samples was submitted to the laboratory for analyses for arsenic, cadmium, lead, and zinc. The field screening results identified concentrations of arsenic, cadmium, lead, and zinc above their respective KDHE RSK values, and the laboratory data confirmed concentrations of arsenic and lead above their respective KDHE RSK values (Burns & McDonnell 2004).

- Contaminated soil – Arsenic and cadmium have been identified in soil at concentrations exceeding their SCDM health-based benchmarks, and lead has been found at concentrations exceeding its KDHE RSK Residential Soil Pathway value on and off the United Zinc property.

4.2 GROUNDWATER PATHWAY

The following sections discuss hydrogeology, targets, and conclusions associated with the groundwater pathway.

4.2.1 Hydrogeologic Setting

According to a preliminary investigation report written by KDHE in 1994, sedimentary rocks from the Paleozoic and Cenozoic Eras underlie Allen County, Kansas. The rocks are largely comprised of interbedded limestone and shale units with rare interformational sandstones. These units are relatively impermeable in the subsurface, however generally weather at or near the surface. The surface weathering can greatly increase the water bearing capacity. Shallow weathered rocks of this age form important low-yielding aquifers throughout Allen County. An unconfined groundwater system is present in the shallow bedrock as indicated by flooded limestone quarries in the site vicinity (Maxim 2003).

The area near the United Zinc facility is estimated to be underlain by five to 20 feet of unconsolidated material composed of silty clay and fine-grained colluvium and residuum. The unconsolidated materials in the vicinity of United Zinc do not yield appreciable amounts of potable groundwater. A seasonal

perched water zone is present during wet periods of the year (Maxim 2003). According to the KGS well database the depth to groundwater in area wells range from approximately six to 80 feet below ground surface (KGS 2007).

4.2.2 Groundwater Targets

The primary source of drinking water for the City of Iola is surface water; therefore, the number of groundwater targets near the United Zinc facility is limited (EPA 2007a). The closest registered well is located within 0.5 mile of United Zinc. The majority of the registered wells within 4 miles of the former United Zinc facility are plugged, and only eight domestic wells are listed as active within a 4-mile target distance limit according to the database of registered wells (KGS 2007). Sampling of the active domestic wells was proposed but only the background private well was sampled during the SI activities due to inability to obtain access or to locate the wells using the locational information provided in the KGS database. This well is actively used for lawn care and for an ornamental pond that contains fish.

4.2.3 Groundwater Pathway Conclusion

The sampling of temporary piezometers during the Phase II FFSA indicated concentrations of cadmium and lead in the groundwater exceeding their respective KDHE RSK values, but arsenic and zinc were detected at concentrations below their KDHE RSK values (Burns & McDonnell 2004). Neither arsenic nor zinc was detected at concentrations exceeding its SCDM health-based benchmarks. Lead was detected in one of the groundwater samples at a concentration exceeding its action level. In addition, cadmium was detected in two groundwater samples exceeding its MCL and in one sample exceeding its SCDM RfD screening concentration (EPA 2004).

Neither arsenic nor lead was detected in the background groundwater sample collected from the private well located on East Garfield Road in Iola during the SI sampling event. Although lead and cadmium were detected in the temporary piezometers during a historical sampling event, a release of heavy metals from United Zinc to groundwater has not been established.

4.3 SURFACE WATER PATHWAY

This section discusses the surface water pathway and includes information pertaining to the hydrologic setting, surface water targets, and conclusions drawn from the analytical data for the surface water and sediment samples collected from the natural drainage areas near the United Zinc facility.

4.3.1 Hydrologic Setting

According to the topography of the land near the United Zinc facility the anticipated direction of stormwater runoff is to the south-southeast towards Rock Creek. Based on visual observations made during the site reconnaissance conducted on behalf of KDHE in 2003, surface drainage from the site was directed toward a drainage ditch located north of the facility that drained into a ditch that flowed southeast towards Rock Creek. Rock Creek located east of the former smelter property drains into Elm Creek, and Elm Creek drains into the Neosho River located southwest of the United Zinc facility.

4.3.2 Surface Water Targets

The primary source of drinking water for the City of Iola is surface water (EPA 2007a). Two drinking water intakes exist 8 miles downstream of United Zinc, on the Neosho River, and two drinking water intakes exist upstream on the west side of the City of Iola on the Neosho River. The nearest surface water intake is two miles west of the facility on the Neosho River. The former United Zinc facility is located within the Upper Neosho Watershed (EPA 2007c). According to the KDHE Kansas Surface Water Register the surface water in Iola, Kansas is listed for general purpose with expected aquatic life, primary recreation use, and food procurement (KDHE 2007b).

4.3.3 Surface Water Pathway Conclusion

Surface water and sediment samples were collected from the natural drainage areas near the former United Zinc facility during the SI to determine if a release of contaminants has occurred to nearby creeks. During the SI surface water and sediment samples were collected from Rock Creek southeast of the facility and from Elm Creek southwest of the facility. Arsenic was detected in two of the sediment samples, and lead was detected in all six of the sediment samples including the background sample. Based on the lead concentrations detected in the sediment samples a segment of actual contamination was established between sediment sample locations 3396-9 and 2296-11 starting in Rock Creek and leading into Elm Creek because they exceeded three times the background concentration (81.6 mg/kg). The overland segment extends from the drainage ditch located north of the facility to the probable point of entry is where the ditch drain surface water runoff into Rock Creek. The 15-mile target distance limit extends from Rock Creek into Elm Creek and ends in the Neosho River as shown on Figure 3; please note that the Neosho River is the surface water body where sample numbers 3396-201, 3396-202, and 3396-203 were collected.

Arsenic was not detected in the surface water samples and lead was only detected in sample 3396-104 at a concentration well below SCDM benchmarks.

During the SI two surface water samples were also collected near the main surface water intake on the Neosho River upstream of the United Zinc facility. Arsenic was not detected in these samples. Lead was detected in both of the surface water samples collected near the surface water intake, but the concentrations detected were below the background surface water sample concentrations that was collected upgradient of the surface water intake. The metals detected in the source samples and in the surface soil have not impacted the drinking water intake located along the Neosho River.

4.4 SOIL EXPOSURE AND AIR PATHWAYS

Section 4.4 discusses the physical conditions, soil and air targets, soil sampling summary, analytical data summary, and conclusions drawn from the analytical data for the soil samples collected from the suspected sources areas. Soil samples were previously collected from residential yards, and slag piles identified potential source areas and nearby properties. Air samples were not collected because actual or potential contamination to the air pathway was not considered significant.

4.4.1 Physical Conditions

Allen County is located within the Osage Plains, and the land is predominantly level with few outstanding differences in the relief of the land. The U.S. Department of Agriculture (USDA) has classified soil in the area as Kenoma silt loam. The Kenoma soil type is described by the USDA as deep, moderately well-drained, very slowly permeable soils on the uplands. These soils are formed in material weathered from sediments high in content of silt and clay (USDA 1978).

The United Zinc facility encompasses 10 parcels of land, equivalent to approximately 17 acres, but the site includes a much larger surrounding area. Investigative actions are underway to further characterize the site. The property has been graded, leveled, and developed since the former smelter operations ceased in the 1920s (Maxim 2003). Most of this area is currently vacant. However, Benntag Southwest, Inc., a MFA Distributor, the Superflea Flea Market, Tucker's Flea Market, a portion of a concrete mixing facility, and some pastureland are present (Maxim 2003, KDHE 2005). The facility is bordered on the north by residential property; on the east by the East Iola Site, a car wash, a former Tyson processing facility, and a movie theater; on the south by a restaurant, a dry cleaner, a car dealership, and agricultural land; and on the west by the Colberly Site, a truck repair facility, and the remaining portion of the concrete mixing facility (Maxim 2003). The facility is also surrounded by residential neighborhoods and two schools (KDHE 2005). The Iola Preschool is located northeast of United Zinc, and the McKinley School is located southwest of United Zinc (Terranext 2005).

4.4.2 Soil and Air Targets

The area surrounding the former United Zinc facility is predominantly residential, and the total population within the 4-mile TDL from the center of the United Zinc property is approximately 8,076 people. Census information indicated 193 residents within 0.25 mile; 1,066 individuals between 0.25 and 0.5 mile; 2,222 people between 0.5 and 1 mile; 3,456 residents between 1 and 2 miles; 861 people between 2 and 3 miles; and 278 individuals between 3 and 4 miles from the United Zinc facility (Missouri Census Data Center 2005). In addition, five schools and two daycares are mixed in with the residential areas surrounding United Zinc.

4.4.3 Soil Exposure and Air Pathway Conclusion

Analytical results of the soil samples collected during the PA activities from residential yards identified arsenic, barium, cadmium, lead, and zinc in the surface soil samples. Arsenic was detected in 160 soil samples at concentrations exceeding its SCDM CR screening concentration. Barium and zinc were detected in all of the soil samples at concentrations below their respective SCDM health-based benchmarks. Cadmium was detected in several soil samples, but only one soil sample contained cadmium at a concentration exceeding its RfD screening concentration. Lead was the most prevalent contaminant at the site. In fact, between August and November 2006, lead was identified and confirmed by the laboratory as exceeding its KDHE RSK Residential Soil Pathway value of 400 mg/kg in 148 soil samples. Background concentrations of lead identified northwest of the United Zinc facility during the PA ranged from 176 mg/kg to 397 mg/kg. Background concentrations of lead identified in the soil collected during the SI sampling differed from the PA and ranged from 21.0 mg/kg to 122 mg/kg.

No air pathway samples were collected because actual or potential contamination to the air migration pathway was not considered significant. The purpose of the SI was identify site-specific background levels of arsenic and lead in the soil, collect surface water and sediment samples from areas where runoff drains from the site, and collection of surface water samples from the surface water intake along Neosho River that provide the drinking water supply to the residents of Iola.

5.0 EMERGENCY RESPONSE CONSIDERATIONS

The National Contingency Plan [40 CFR 300.415(b)(2)] authorizes the EPA to consider emergency response actions at those facilities that pose an imminent threat to human health or the environment. For the following reasons, a referral to EPA Regions 7 for emergency response activities appears necessary:

- The area of soil contamination expands beyond the United Zinc property boundaries. The area of soil contamination includes the United Zinc facility, because contamination was identified on the property during historical investigations.
- Further residential screening is recommended for United Zinc to determine the extent of contaminated soil surrounding the former United Zinc facility, and to identify residential yards that contain contaminated soil with time-critical removal action levels.

6.0 SUMMARY

The former United Zinc smelter facility was comprised of 10 parcels of land, equivalent to approximately 17 acres, but the overall site area evaluated includes a much larger surrounding section. The property has been graded, leveled, and developed since the former smelter operations ceased in the 1920s (Maxim 2003). Most of the property where the former smelter was located is vacant but includes the following structures: Brenntag Southwest, Inc., a MFA Distributor, the Superflea Flea Market, Tucker's Flea Market, a portion of a concrete mixing facility, and some pastureland (Maxim 2003, KDHE 2005). The facility is bordered on the north by residential property; on the east by the East Iola Site, a car wash, a former Tyson processing facility, and a movie theater; on the south by a restaurant, a dry cleaner, a car dealership, and agricultural land; and on the west by the Colberly Site, a truck repair facility, and the remaining portion of the concrete mixing facility (Maxim 2003). The facility is also surrounded by residential neighborhoods and two schools (KDHE 2005). Iola Preschool is located northeast of United Zinc, and the McKinley School is located southwest of United Zinc (Terranext 2005).

During the 2003 Phase I site reconnaissance, smelter waste was observed, and the quantity was estimated as approximately 1,800 cubic yards, concentrated in the southwest corner of the vacant property at United Zinc (Burns & McDonnell 2004, Terranext 2005). Zinc smelter waste is known to contain elevated concentrations of heavy metals from smelting activities—including arsenic, cadmium, lead, and zinc. Sampling of the soil, groundwater, sediment, surface water, smelter waste, and surrounding areas began in 2004 to determine the potential impact from the former smelting operations at United Zinc.

A release of lead from United Zinc to the soil has been established based on the results of the PA sampling collected from August through November 2006. Additional sampling was conducted in March 2007 determined that a release of contaminants to the surface waster pathway associated with United Zinc has occurred based on the concentrations of lead identified in the sediment samples collected from Rock and Elm Creek.

United Zinc is not listed in the EPA RCRIS database, but was identified as a potential hazardous waste site and entered into CERCLIS in 2005.

The pertinent HRS factors associated with United Zinc are as follows:

- A release of contaminants associated with past activities at the United Zinc facility has been established. Results of the PA sampling effort indicate the presence of lead at concentrations exceeding its KDHE RSK Residential Soil Pathway value.

- The area of contaminated soil includes much more than just the former United Zinc facility property. Lead-contaminated soil has been identified in 148 residential samples during the PA, exceeding the KDHE RSK value of 400 mg/kg. In addition, lead-contaminated soils were documented at two schools at concentrations above lead's time-critical removal action level.

- The closest registered well is located within 0.5 mile of United Zinc. Most registered wells within 4 miles of the former United Zinc facility are plugged (KGS 2007). The primary source of drinking water in Iola is surface water. One private well located upgradient of the United Zinc facility was sampled during the SI and neither arsenic nor lead was detected in the sample.

- Two drinking water intakes exist 8 miles downstream of United Zinc, on the Neosho River. Two samples were collected near the main surface water intake on the Neosho River during the SI. Arsenic was not detected in the surface water samples collected near the intake, and lead was detected at low concentrations in those samples. Based on these results the low levels of metals detected in the source samples and soils have not impact the drinking water intake.

- A segment of actual contamination was established between samples collected in Rock Creek and ending in Elm Creek because lead concentrations detected in the sediment samples exceeded three times the background concentration. The 15-mile target distance limit extends from Rock Creek into Elm Creek and ends in the Neosho River.

7.0 REFERENCES

Burns & McDonnell Engineering Company Inc. (Burns & McDonnell). 2004. Phase II Focused Former Smelter Assessment of the Former United Zinc #1 Smelter in Iola, Kansas. December.

Kansas Department of Health and Environment (KDHE). 2003. Risk-Based Standards for Kansas Manual. March 1.

KDHE. 2005. Preliminary Removal Site Evaluation for United Zinc Smelter #1 Site in Iola, Kansas. September.

KDHE. 2006. Bureau of Environmental Remediation/Remedial Section – A Short History of the Zinc Smelting Industry in Kansas. December 28.

KDHE. 2007a. Risk-Based Standards for Kansas Manual – 4th Version. June.

KDHE. 2007b. Kansas Surface Water Register. On-line address: http://www.kdheks.gov/befs/download/Kansas_Surface_Register. Accessed on September 24, 2007. April 18.

Kansas Geological Survey (KGS). 2007. KGS Index of Water Wells Database. Last updated January 31, 2007.

Missouri Census Data Center. 2005. MABLE/Geocorr2K: Geographic Correspondence Engine with Census 2000 Geography. Version 1.2. On-line Address: http://mcdc2.missouri.edu/websas/geocorr2k.html. Accessed: January 16, 2007. Last updated: January 2007.

Maxim Technologies, Inc. (Maxim). 2003. Focused Former Smelter Phase I Report. Group B Smelters. United Zinc #1 in Iola, Kansas. December 19.

Terranext. 2005. Residential Yard Soil Sampling Report for United Zinc #1 in Iola, Kansas. June 27.

Tetra Tech EM Inc. (Tetra Tech). 2006. Removal Site Evaluation Report for United Zinc #1 Site. September 26.

Tetra Tech. 2007a. Preliminary Assessment report for the United Zinc #1 Site in Iola, Kansas. February 28.

Tetra Tech. 2007b. Quality Assurance Project Plan for Site Investigation activities at the United Zinc #1 Site in Iola, Kansas. March 1.

United Stated Department of Agriculture. 1978. Soil Survey of Allen County, Kansas. November.

United States Environmental Protection Agency (EPA). 2004. Superfund Chemical Data Matrix (SCDM) Table. Washington, D.C. January.

EPA. 2006. Envirofacts Warehouse. December 8. On-line address: http://oaspub.eap.gov/enviro/. Accessed on December 15, 2006.

EPA. 2007a. Envirofacts Warehouse-Safe Drinking Water Information System. On-line address: http://oaspub.eap.gov/enviro/. Accessed on January 25, 2007.

EPA. 2007b. Envirofacts Warehouse. On-line address: http://oaspub.eap.gov/enviro/. Accessed on August 22, 2007.

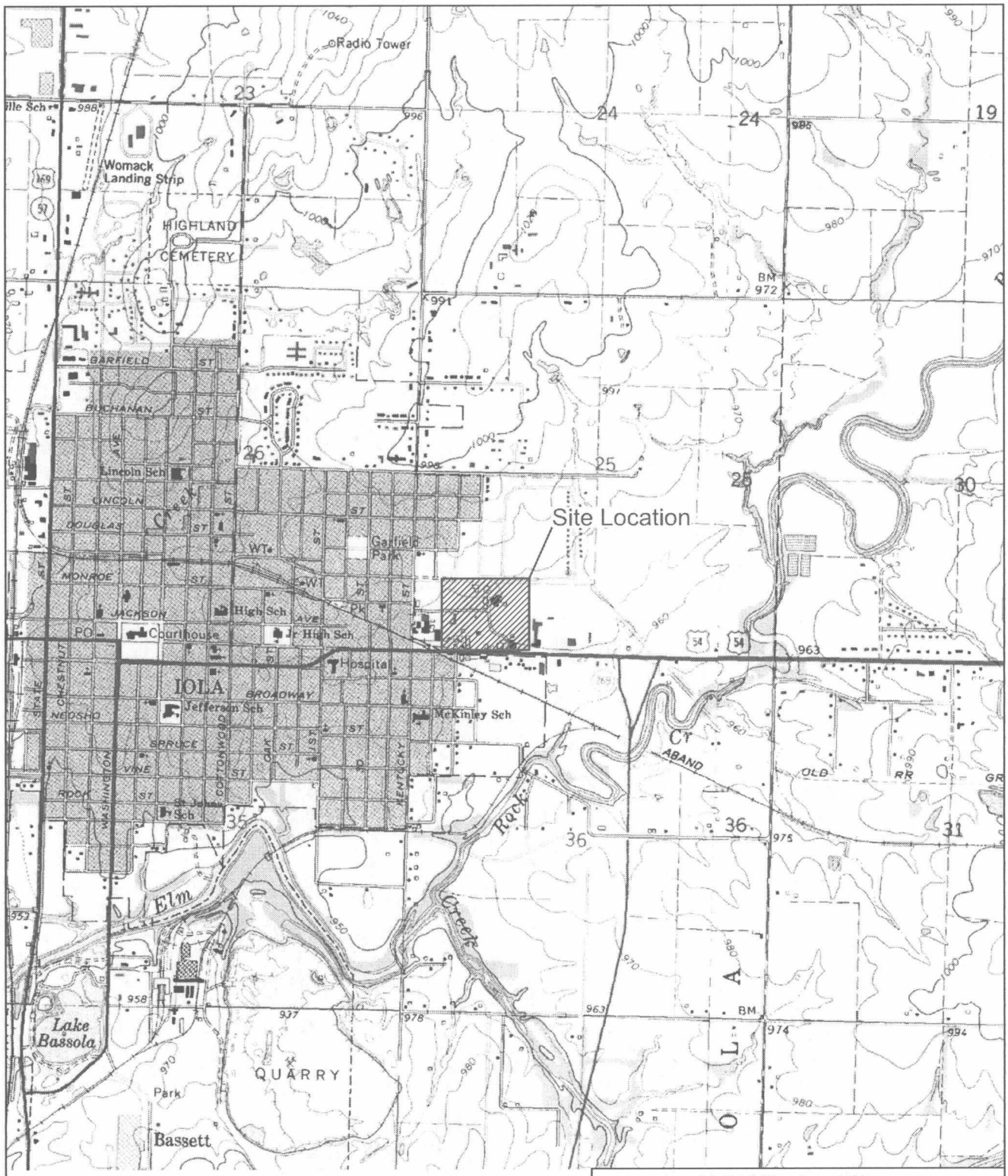
EPA. 2007c. Surf Your Watershed. On-line address: http://cfpub1.epa.gov/surf/huc. Accessed on September 24. 2007. Last updated September 24, 2007.

U.S. Geological Survey (USGS). 1984. Iola, Kansas, 7.5-minute topographic quadrangle.

USGS. 2007. Average Concentrations of Elements in Allen County, Kansas. On-line address: http://tin.er.usgs.gov/geochem/county. Accessed on September 17, 2007. Last modified August 10, 2007.

APPENDIX A

FIGURES



Source: USGS Allen County, KS 7.5 Minute Topo Quad, 1959, PR 1984

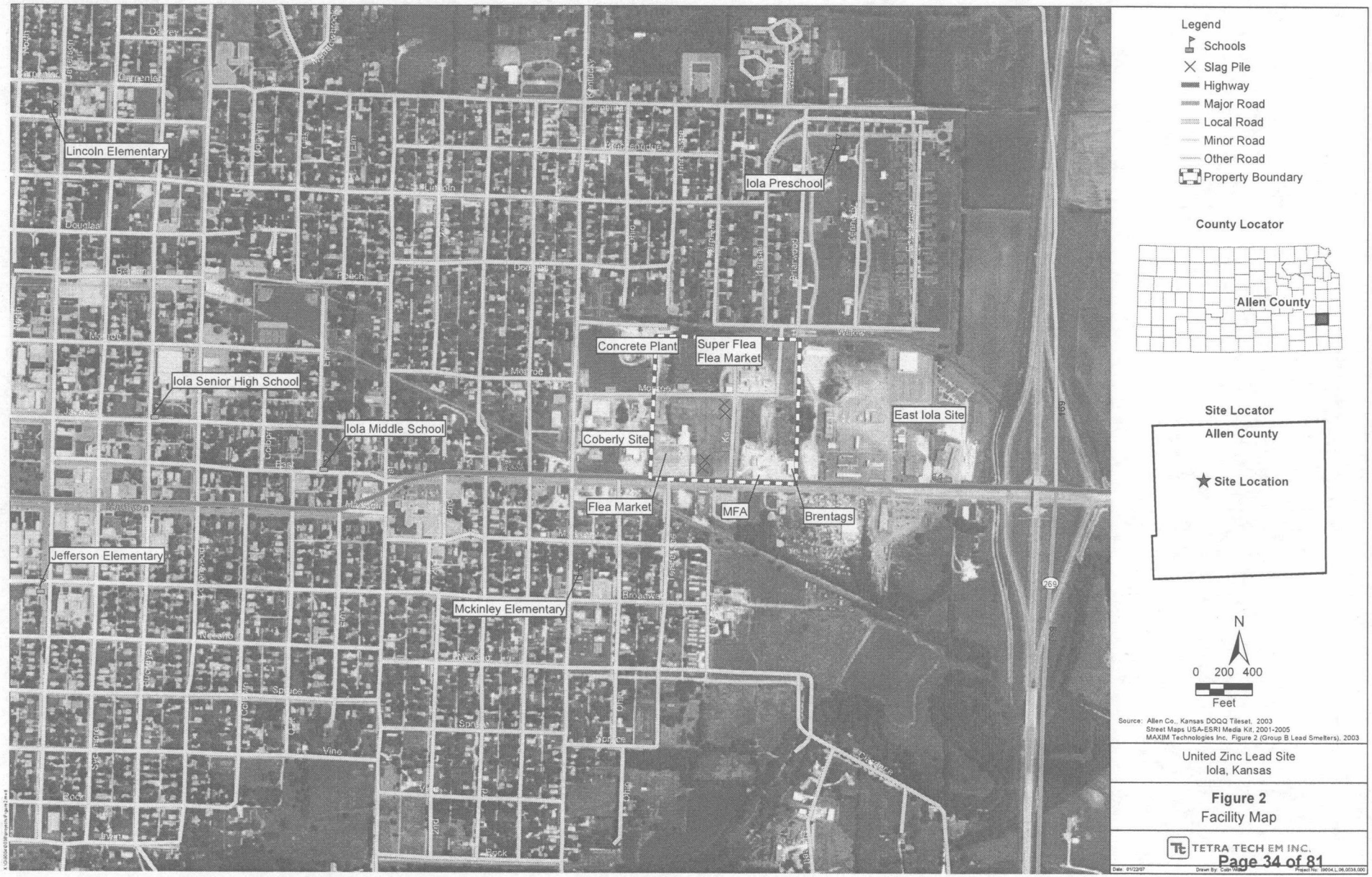
United Zinc Lead Site
Iola, Kansas

Figure 1
Facility Location Map

Tetra Tech EM Inc.

Date: 01/17/07 Drawn By: Bill Spring Project No: 19004.L06.0038.000

X:\G\9004\0038\dwg\figure1.dwg

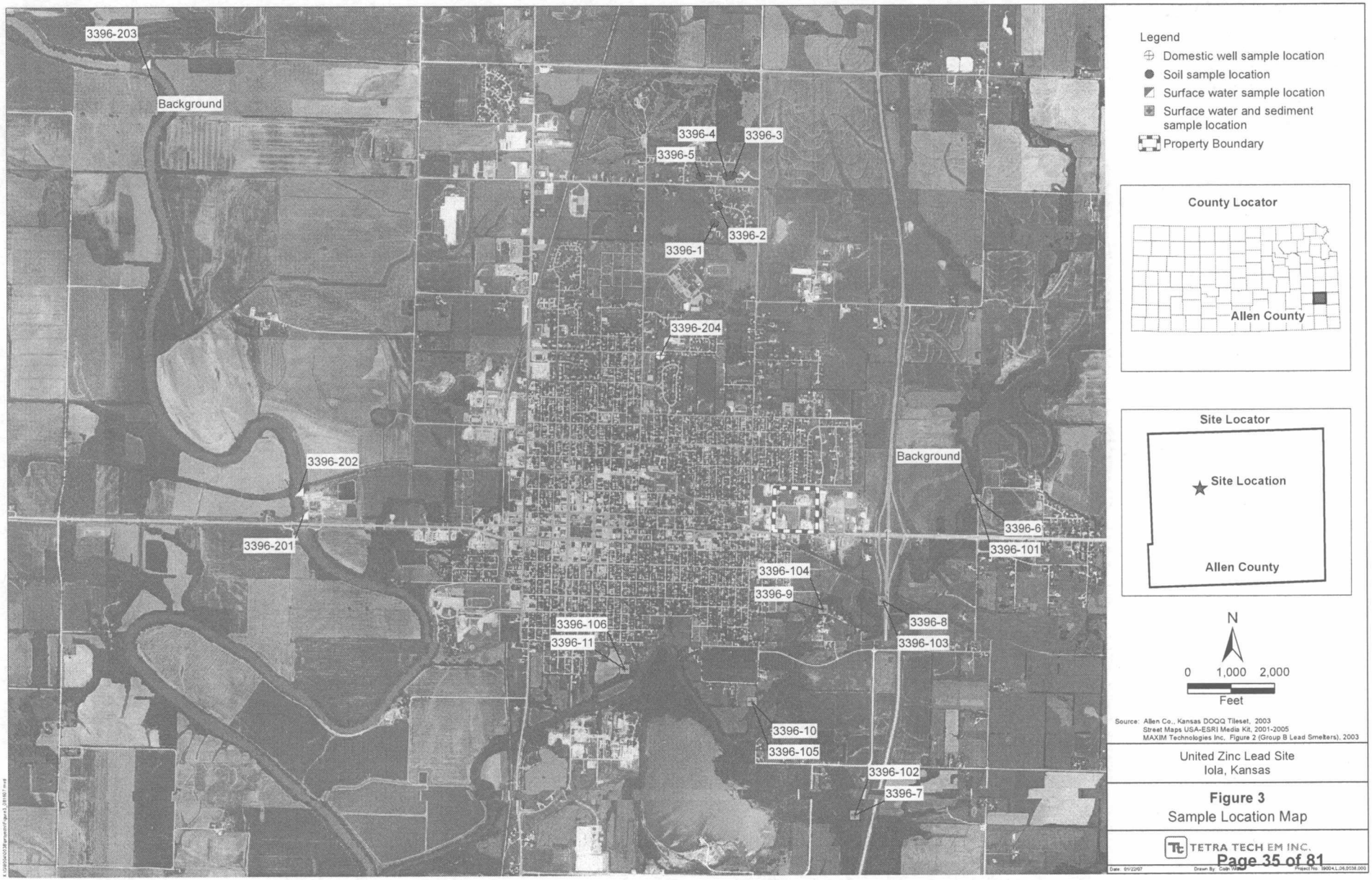


Source: Allen Co., Kansas DOQQ Tileset, 2003
Street Maps USA-ESRI Media Kit, 2001-2005
MAXIM Technologies Inc. Figure 2 (Group B Lead Smelters), 2003

United Zinc Lead Site
Iola, Kansas

Figure 2
Facility Map

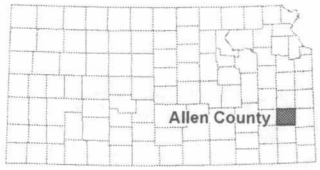
TETRA TECH EM INC.


3396-203
Background
3396-4
3396-3
3396-5
3396-2
3396-1
3396-204
3396-202
3396-201
Background
3396-6
3396-101
3396-104
3396-9
3396-8
3396-103
3396-106
3396-11
3396-10
3396-105
3396-102
3396-7
Legend
Domestic well sample location
Soil sample location
Surface water sample location
Surface water and sediment sample location
Property Boundary
County Locator
Allen County
Site Locator
Site Location
Allen County
N
0 1,000 2,000
Feet
Source: Allen Co., Kansas DOQQ Tileset, 2003
Street Maps USA-ESRI Media Kit, 2001-2005
MAXIM Technologies Inc. Figure 2 (Group B Lead Smelters), 2003
United Zinc Lead Site
Iola, Kansas
Figure 3
Sample Location Map
TETRA TECH EM INC.

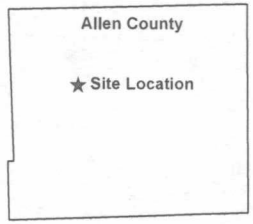
Legend

- Schools
- Lead Results between 400-800 mg/kg
- Lead Results > 800 mg/kg
- Slag Pile
- Contaminated Soil Boundary
- Property Boundary
- Highway
- Major Road
- Local Road
- Minor Road
- Other Road

County Locator



Site Locator



N

0 400 800

Scale in Feet

Source: Allen Co., Kansas DOQQ Tileset, 2003
Street Maps USA-ESRI Media Kit, 2001-2005

United Zinc Lead Site
Iola, Kansas

Figure 4
Lead Concentrations Exceeding KDHE
Risk Residential Soil Pathway Value

TETRA TECH EM INC.

Date: 01/19/07 Drawn By: Colin Willits Project No: I9004.L.06.0038.000

APPENDIX B

FIELD SHEETS, CHAIN-OF-CUSTODY RECORDS, AND LOGBOOK

Sample Collection Field Sheet
US EPA Region 7
Kansas City, KS

ASR Number: 3396 **Sample Number:** 1 **QC Code:** __ **Matrix:** Solid **Tag ID:** 3396-1-__

Project ID: EMA78Q00 **Project Manager:** Eddie McGlasson
Project Desc: United Zinc No. 1 site sampling
City: Iola **State:** Kansas
Program: Superfund
Site Name: United Zinc No. 1 - **Site ID:** A78Q **Site OU:** 00

Location Desc: EPA 1515 C #1

External Sample Number: _____

Expected Conc: (or Circle One: Low Medium High) **Date** **Time(24 hr)**

Latitude: 37.94156° **Sample Collection: Start:** 3/19/07 13:00
Longitude: -95.39420° **End:** __/__/__ __:__

Laboratory Analyses:

Container	Preservative	Holding Time	Analysis
1 - 8 oz glass	4 Deg C	180 Days	1 Metals in Solids by ICP

Sample Comments:
(N/A)

118 Cardinal Dr
Iola, KS

Sample Collected By: SL
KCAH

Sample Collection Field Sheet
US EPA Region 7
Kansas City, KS

ASR Number: 3396 **Sample Number:** 2 **QC Code:** __ **Matrix:** Solid **Tag ID:** 3396-2-__

Project ID: EMA78Q00 **Project Manager:** Eddie McGlasson
Project Desc: United Zinc No. 1 site sampling
City: Iola **State:** Kansas
Program: Superfund
Site Name: United Zinc No. 1 - **Site ID:** A78Q **Site OU:** 00

Location Desc: EPA 1340 C-1

External Sample Number: _____

Expected Conc: (or Circle One: Low Medium High) **Date** **Time(24 hr)**

Latitude: 37.94265° **Sample Collection: Start:** 3/19/07 13:35
Longitude: -95.39393° **End:** __/__/__ __:__

Laboratory Analyses:

Container	Preservative	Holding Time	Analysis
1 - 8 oz glass	4 Deg C	180 Days	1 Metals in Solids by ICP

Sample Comments:
(N/A)

218 Cardinal Dr
Iola, KS

Sample Collected By: ~~SL~~ RC/AH

Sample Collection Field Sheet
US EPA Region 7
Kansas City, KS

ASR Number: 3396 **Sample Number:** 3 **QC Code:** __ **Matrix:** Solid **Tag ID:** 3396-3-__

Project ID: EMA78Q00 **Project Manager:** Eddie McGlasson
Project Desc: United Zinc No. 1 site sampling
City: Iola **State:** Kansas
Program: Superfund
Site Name: United Zinc No. 1 - **Site ID:** A78Q **Site OU:** 00

Location Desc: EPA 1512 C-1

External Sample Number: _____

Expected Conc: (or Circle One: Low Medium High) **Date** **Time(24 hr)**

Latitude: 37.94458° **Sample Collection: Start:** 3/19/07 14:00
Longitude: -95.39283° **End:** __/__/__ __:__

Laboratory Analyses:

Container	Preservative	Holding Time	Analysis
1 - 8 oz glass	4 Deg C	180 Days	1 Metals in Solids by ICP

Sample Comments:
(N/A)

1010 Dewitt DR.
Iola, Ks.

Sample Collected By: SL RC/AH

Sample Collection Field Sheet
US EPA Region 7
Kansas City, KS

ASR Number: 3396 **Sample Number:** 4 **QC Code:** __ **Matrix:** Solid **Tag ID:** 3396-4-__

Project ID: EMA78Q00 **Project Manager:** Eddie McGlasson
Project Desc: United Zinc No. 1 site sampling
City: Iola **State:** Kansas
Program: Superfund
Site Name: United Zinc No. 1 - **Site ID:** A78Q **Site OU:** 00

Location Desc: EPA 1573 C-1

External Sample Number: _____

Expected Conc: (or Circle One: Low Medium High) **Date** **Time(24 hr)**

Latitude: 37.94453° **Sample Collection: Start:** 3/19/07 14:15
Longitude: -95.39326° **End:** __/__/__ __:__

Laboratory Analyses:

Container	Preservative	Holding Time	Analysis
1 - 8 oz glass	4 Deg C	180 Days	1 Metals in Solids by ICP

Sample Comments:
(N/A)

1002 Dewitt DR
Iola KS

Sample Collected By: SL AK/RC

Sample Collection Field Sheet
US EPA Region 7
Kansas City, KS

ASR Number: 3396 **Sample Number:** 5 **QC Code:** __ **Matrix:** Solid **Tag ID:** 3396-5-__

Project ID: EMA78Q00 **Project Manager:** Eddie McGlasson
Project Desc: United Zinc No. 1 site sampling
City: Iola **State:** Kansas
Program: Superfund
Site Name: United Zinc No. 1 - **Site ID:** A78Q **Site OU:** 00

Location Desc: EPA 1574 C-1

External Sample Number: _____

Expected Conc: (or Circle One: Low Medium High) **Date** **Time(24 hr)**

Latitude: 37.94447° **Sample Collection: Start:** 3/19/07 14:33
Longitude: -95.39539° **End:** __/__/__ __:__

Laboratory Analyses:

Container	Preservative	Holding Time	Analysis
1 - 8 oz glass	4 Deg C	180 Days	1 Metals In Solids by ICP

Sample Comments:

(N/A)

Sample Collected By: SL

Sample Collection Field Sheet
US EPA Region 7
Kansas City, KS

ASR Number: 3396 **Sample Number:** 6 **QC Code:** __ **Matrix:** Solid **Tag ID:** 3396-6-__

Project ID: EMA78Q00 **Project Manager:** Eddie McGlasson
Project Desc: United Zinc No. 1 site sampling
City: Iola **State:** Kansas
Program: Superfund
Site Name: United Zinc No. 1 - **Site ID:** A78Q **Site OU:** 00

Location Desc: Background

External Sample Number: _____

Expected Conc: (or Circle One: Low Medium High) **Date** **Time(24 hr)**

Latitude: 37.92451° **Sample Collection: Start:** 3/20/07 07:45
Longitude: -95.37253° **End:** __/__/__ __:__

Laboratory Analyses:

Container	Preservative	Holding Time	Analysis
1 - 8 oz glass	4 Deg C	180 Days	1 Metals in Solids by ICP

Sample Comments:

(N/A)

N. of Hwy 54 just west of Rd 1800
w/ surface water sample #101

Sample Collected By: Stfe

Sample Collection Field Sheet
US EPA Region 7
Kansas City, KS

ASR Number: 3396 **Sample Number:** 7 **QC Code:** __ **Matrix:** Solid **Tag ID:** 3396-7-__

Project ID: EMA78Q00 **Project Manager:** Eddie McGlasson
Project Desc: United Zinc No. 1 site sampling
City: Iola **State:** Kansas
Program: Superfund
Site Name: United Zinc No. 1 - **Site ID:** A78Q **Site OU:** 00

Location Desc: Loc #4

External Sample Number: _____

Expected Conc: (or Circle One: Low Medium High) **Date** **Time(24 hr)**

Latitude: 37.904430° **Sample Collection: Start:** 3/20/07 09:15
Longitude: -95.38177 **End:** __/__/__ __:__

Laboratory Analyses:

Container	Preservative	Holding Time	Analysis
1 - 8 oz glass	4 Deg C	180 Days	1 Metals in Solids by ICP

Sample Comments:
(N/A) S. of Nebraska Rd on W. side of Hwy 169

w/ surface water samp # 102

Sample Collected By: SMC

Sample Collection Field Sheet
US EPA Region 7
Kansas City, KS

ASR Number: 3396 **Sample Number:** 8 **QC Code:** __ **Matrix:** Solid **Tag ID:** 3396-8-__

Project ID: EMA78Q00 **Project Manager:** Eddie McGlasson
Project Desc: United Zinc No. 1 site sampling
City: Iola **State:** Kansas
Program: Superfund
Site Name: United Zinc No. 1 - **Site ID:** A78Q **Site OU:** 00

Location Desc: Loc # 2

External Sample Number: _____

Expected Conc: (or Circle One: Low Medium High) **Date** **Time(24 hr)**

Latitude: 37.91795° **Sample Collection: Start:** 3/10/07 09:31
Longitude: -95.37988° **End:** __/__/__ __:__

Laboratory Analyses:

Container	Preservative	Holding Time	Analysis
1 - 8 oz glass	4 Deg C	180 Days	1 Metals in Solids by ICP

Sample Comments: Rock Creek
(N/A) S. of Hwy 54 on W. side of 169 Hwy

W surf. water sample #103

Sample Collected By: SL RC

Sample Collection Field Sheet
US EPA Region 7
Kansas City, KS

ASR Number: 3396 **Sample Number:** 9 **QC Code:** __ **Matrix:** Solid **Tag ID:** 3396-9-__

Project ID: EMA78Q00 **Project Manager:** Eddie McGlasson
Project Desc: United Zinc No. 1 site sampling
City: Iola **State:** Kansas
Program: Superfund
Site Name: United Zinc No. 1 - **Site ID:** A78Q **Site OU:** 00

Location Desc: Loc #3

External Sample Number: _____

Expected Conc: (or Circle One: Low Medium High) **Date** **Time(24 hr)**

Latitude: 37.91732° **Sample Collection: Start:** 3/20/07 10:06
Longitude: -95.38470° **End:** __/__/__ __:__

Laboratory Analyses:

Container	Preservative	Holding Time	Analysis
1 - 8 oz glass	4 Deg C	180 Days	1 Metals in Solids by ICP

Sample Comments:
(N/A)

Rock Creek.

E. of Tenth St on S. side of Clarence St.

w/ surf. water sample #104

Sample Collected By: BL

Sample Collection Field Sheet
US EPA Region 7
Kansas City, KS

ASR Number: 3396 **Sample Number:** 10 **QC Code:** __ **Matrix:** Solid **Tag ID:** 3396-10-__

Project ID: EMA78Q00 **Project Manager:** Eddie McGlasson
Project Desc: United Zinc No. 1 site sampling
City: Iola **State:** Kansas
Program: Superfund
Site Name: United Zinc No. 1 - **Site ID:** A78Q **Site OU:** 00

Location Desc: Loc # 4

External Sample Number: _____

Expected Conc: (or Circle One: Low Medium High) **Date** **Time(24 hr)**

Latitude: 37.91135° **Sample Collection: Start:** 3/20/07 10:20
Longitude: -95.39030 **End:** __/__/__ __:__

Laboratory Analyses:

Container	Preservative	Holding Time	Analysis
1 - 8 oz glass	4 Deg C	180 Days	1 Metals in Solids by ICP

Sample Comments:
(N/A)

Elm creek
S. end of Kentucky St.

w/ surf. water sample # 105

Sample Collected By: SL

Sample Collection Field Sheet
US EPA Region 7
Kansas City, KS

ASR Number: 3396 **Sample Number:** 11 **QC Code:** __ **Matrix:** Solid **Tag ID:** 3396-11-__

Project ID: EMA78Q00 **Project Manager:** Eddie McGlasson
Project Desc: United Zinc No. 1 site sampling
City: Iola **State:** Kansas
Program: Superfund
Site Name: United Zinc No. 1 - **Site ID:** A78Q **Site OU:** 00

Location Desc: loc #5

External Sample Number: _____

Expected Conc: (or Circle One: Low Medium High) **Date** **Time(24 hr)**

Latitude: 37.91323° **Sample Collection: Start:** 3/20/07 10:53
Longitude: -95.40063 **End:** __/__/__ __:__

Laboratory Analyses:

Container	Preservative	Holding Time	Analysis
1 - 8 oz glass	4 Deg C	180 Days	1 Metals in Solids by ICP

Sample Comments:
(N/A)

Elm Creek
South End of Colborn St.
w/ surf water sample #106

Sample Collected By: RC

Sample Collection Field Sheet
US EPA Region 7
Kansas City, KS

ASR Number: 3396 **Sample Number:** 101 **QC Code:** __ **Matrix:** Water **Tag ID:** 3396-101-__

Project ID: EMA78Q00 **Project Manager:** Eddie McGlasson
Project Desc: United Zinc No. 1 site sampling
City: Iola **State:** Kansas
Program: Superfund
Site Name: United Zinc No. 1 - **Site ID:** A78Q **Site OU:** 00

Location Desc: ICP sample Background

External Sample Number: _____

Expected Conc: (or Circle One: Low Medium High) **Date** **Time(24 hr)**

Latitude: 37 92451° **Sample Collection: Start:** 3/20/07 09:45
Longitude: -95 37253° **End:** __/__/__ __:__

Laboratory Analyses:

Container	Preservative	Holding Time	Analysis
1 - 1 Liter Cubitainer	HNO3 acidify, 4 Deg C	180 Days	1 Metals in Water by ICP

Sample Comments: Rock Creek
~~(N/A)~~
N. of Hwy 54 west of Rd 1800.

sed. # 6

Sample Collected By: SLPC

Sample Collection Field Sheet
US EPA Region 7
Kansas City, KS

ASR Number: 3396 **Sample Number:** 102 **QC Code:** __ **Matrix:** Water **Tag ID:** 3396-102-__

Project ID: EMA78Q00 **Project Manager:** Eddie McGlasson
Project Desc: United Zinc No. 1 site sampling
City: Iola **State:** Kansas
Program: Superfund
Site Name: United Zinc No. 1 - **Site ID:** A78Q **Site OU:** 00

Location Desc: ICP sample Loc #1

External Sample Number: _____

Expected Conc: (or Circle One: Low Medium High) **Date** **Time(24 hr)**

Latitude: 37.90430 **Sample Collection: Start:** 3/20/07 09:15
Longitude: -95.38177 **End:** __/__/__ __:__

Laboratory Analyses:

Container	Preservative	Holding Time	Analysis
1 - 1 Liter Cubitainer	HNO3 acidify, 4 Deg C	180 Days	1 Metals in Water by ICP

Sample Comments:
(N/A) S. of Nebraska Rd. on W. side of Hwy 169.

w/ sed. sample # 7

Sample Collected By: SMC

Sample Collection Field Sheet
US EPA Region 7
Kansas City, KS

ASR Number: 3396 **Sample Number:** 103 **QC Code:** __ **Matrix:** Water **Tag ID:** 3396-103-__

Project ID: EMA78Q00 **Project Manager:** Eddie McGlasson
Project Desc: United Zinc No. 1 site sampling
City: Iola **State:** Kansas
Program: Superfund
Site Name: United Zinc No. 1 - **Site ID:** A78Q **Site OU:** 00

Location Desc: ICP sample Loc #2

External Sample Number: _____

Expected Conc: (or Circle One: Low Medium High) **Date** **Time(24 hr)**

Latitude: 37.91795° **Sample Collection: Start:** 3/20/07 09:3(
Longitude: -95.37988° **End:** __/__/__ __:__

Laboratory Analyses:

Container	Preservative	Holding Time	Analysis
1 - 1 Liter Cubitainer	HNO3 acidify, 4 Deg C	180 Days	1 Metals in Water by ICP

Sample Comments:
(N/A)

Rock Creek
S. of Hwy 54 on W. side of 169 Hwy

w/ sed. sample #8

Sample Collected By: ~~SL~~ RC

Sample Collection Field Sheet
US EPA Region 7
Kansas City, KS

ASR Number: 3396 **Sample Number:** 104 **QC Code:** __ **Matrix:** Water **Tag ID:** 3396-104-__

Project ID: EMA78Q00 **Project Manager:** Eddie McGlasson
Project Desc: United Zinc No. 1 site sampling
City: Iola **State:** Kansas
Program: Superfund
Site Name: United Zinc No. 1 - **Site ID:** A78Q **Site OU:** 00

Location Desc: ICP sample Loc #3

External Sample Number: _____

Expected Conc: (or Circle One: Low Medium High) **Date** **Time(24 hr)**

Latitude: 37.91732° **Sample Collection: Start:** 3/20/07 10:26
Longitude: -95.38470° **End:** __/__/__ __:__

Laboratory Analyses:

Container	Preservative	Holding Time	Analysis
1 - 1 Liter Cubitainer	HNO3 acidify, 4 Deg C	180 Days	1 Metals in Water by ICP

Sample Comments: Rock Creek
(~~N/A~~) East of Tenth St. on south side of Clarence St.

w/ sed. sample #9

Sample Collected By: BL/RC

Sample Collection Field Sheet
US EPA Region 7
Kansas City, KS

ASR Number: 3396 **Sample Number:** 105 **QC Code:** __ **Matrix:** Water **Tag ID:** 3396-105-__

Project ID: EMA78Q00 **Project Manager:** Eddie McGlasson
Project Desc: United Zinc No. 1 site sampling
City: Iola **State:** Kansas
Program: Superfund
Site Name: United Zinc No. 1 - **Site ID:** A78Q **Site OU:** 00

Location Desc: ICP sample loc #4

External Sample Number: _____

Expected Conc: (or Circle One: Low Medium High) **Date** **Time(24 hr)**

Latitude: 37.91135° **Sample Collection: Start:** 3/20/07 10:20
Longitude: -95.39030° **End:** __/__/__ __:__

Laboratory Analyses:

Container	Preservative	Holding Time	Analysis
1 - 1 Liter Cubitainer	HNO3 acidify, 4 Deg C	180 Days	1 Metals in Water by ICP

Sample Comments:
(N/A)

Elm Creek
South end Kentucky St.

w/ sed sample #10

Sample Collected By: SL RC

Sample Collection Field Sheet
US EPA Region 7
Kansas City, KS

ASR Number: 3396 **Sample Number:** 106 **QC Code:** __ **Matrix:** Water **Tag ID:** 3396-106-__

Project ID: EMA78Q00 **Project Manager:** Eddie McGlasson
Project Desc: United Zinc No. 1 site sampling
City: Iola **State:** Kansas
Program: Superfund
Site Name: United Zinc No. 1 - **Site ID:**-A78Q **Site OU:** 00

Location Desc: ICP sample Loc #5

External Sample Number: _____

Expected Conc: (or Circle One: Low Medium High) **Date** **Time(24 hr)**

Latitude: 37.91323° **Sample Collection: Start:** 3/20/07 10:53
Longitude: -95.40063° **End:** __/__/__ __:__

Laboratory Analyses:

Container	Preservative	Holding Time	Analysis
1 - 1 Liter Cubitainer	HNO3 acidify, 4 Deg C	180 Days	1 Metals in Water by ICP

Sample Comments:
(N/A)

Elm Creek
South end of Colborn St.
w/ sed. sample #11

Sample Collected By: [illegible]

Sample Collection Field Sheet
US EPA Region 7
Kansas City, KS

ASR Number: 3396 **Sample Number:** 107 **QC Code:** FB **Matrix:** Water **Tag ID:** 3396-107-FB

Project ID: EMA78Q00 **Project Manager:** Eddie McGlasson
Project Desc: United Zinc No. 1 site sampling
City: Iola **State:** Kansas
Program: Superfund
Site Name: United Zinc No. 1 - **Site ID:** A78Q **Site OU:** 00

Location Desc: ICP Field Blank sample

External Sample Number: _____

Expected Conc: (or Circle One: Low Medium High) **Date** **Time(24 hr)**

Latitude: ___ ___ ___ **Sample Collection: Start:** 3/20/07 14:10

Longitude: ___ ___ ___ **End:** __/__/__ __:__

Laboratory Analyses:

Container	Preservative	Holding Time	Analysis
1 - 1 Liter Cubitainer	HNO3 acidify, 4 Deg C	180 Days	1 Metals in Water by ICP

Sample Comments:

(N/A)

Sample Collected By: RC CAA

Sample Collection Field Sheet
US EPA Region 7
Kansas City, KS

ASR Number: 3396 **Sample Number:** 201 **QC Code:** __ **Matrix:** Water **Tag ID:** 3396-201-__

Project ID: EMA78Q00 **Project Manager:** Eddie McGlasson
Project Desc: United Zinc No. 1 site sampling
City: Iola **State:** Kansas
Program: Superfund
Site Name: United Zinc No. 1 - **Site ID:** A78Q **Site OU:** 00

Location Desc: ICP/MS sample Infef

External Sample Number: _____

Expected Conc: (or Circle One: Low Medium High) **Date** **Time(24 hr)**

Latitude: 37.92256° **Sample Collection: Start:** 3/21/07 09:48
Longitude: -95.42666° **End:** __/__/__ __:__

Laboratory Analyses:

Container	Preservative	Holding Time	Analysis
1 - 1 Liter Cubitainer	HNO3 to pH<2	180 Days	1 Metals in Water by ICP/MS

Sample Comments:
(N/A) Neosho River near intake

Sample Collected By: ~~BL~~ RC

Sample Collection Field Sheet
US EPA Region 7
Kansas City, KS

ASR Number: 3396 **Sample Number:** 202 **QC Code:** __ **Matrix:** Water **Tag ID:** 3396-202-__

Project ID: EMA78Q00 **Project Manager:** Eddie McGlasson
Project Desc: United Zinc No. 1 site sampling
City: Iola **State:** Kansas
Program: Superfund
Site Name: United Zinc No. 1 - **Site ID:** A78Q **Site OU:** 00

Location Desc: ICP/MS sample Boat Ramp.

External Sample Number: _____

Expected Conc: (or Circle One: Low Medium High) **Date** **Time(24 hr)**

Latitude: ~~37.95~~ 37.92401° **Sample Collection: Start:** 3/25/07 09:53

Longitude: -95.42706° **End:** __/__/__ __:__

Laboratory Analyses:

Container	Preservative	Holding Time	Analysis
1 - 1 Liter Cubitainer	HNO3 to pH<2	180 Days	1 Metals in Water by ICP/MS

Sample Comments:

(N/A) Boat ramp - upstream from intake on Neosho River

Sample Collected By: ~~JR~~ RC

Sample Collection Field Sheet
US EPA Region 7
Kansas City, KS

ASR Number: 3396 **Sample Number:** 203 **QC Code:** __ **Matrix:** Water **Tag ID:** 3396-203-__

Project ID: EMA78Q00 **Project Manager:** Eddie McGlasson
Project Desc: United Zinc No. 1 site sampling
City: Iola **State:** Kansas
Program: Superfund
Site Name: United Zinc No. 1 - **Site ID:** A78Q **Site OU:** 00

Location Desc: ICP/MS sample Neosho River Background.

External Sample Number: _____

Expected Conc: (or Circle One: Low Medium High) **Date** **Time(24 hr)**

Latitude: 37.95075° **Sample Collection: Start:** 3/21/07 10:13
Longitude: -95.44013° **End:** __/__/__ __:__

Laboratory Analyses:

Container	Preservative	Holding Time	Analysis
1 - 1 Liter Cubitainer	HNO3 to pH<2	180 Days	1 Metals in Water by ICP/MS

Sample Comments:
(N/A) Neosho River - Background

Sample Collected By: SK RC

Sample Collection Field Sheet
US EPA Region 7
Kansas City, KS

ASR Number: 3396 **Sample Number:** 204 **QC Code:** __ **Matrix:** Water **Tag ID:** 3396-204-__

Project ID: EMA78Q00 **Project Manager:** Eddie McGlasson
Project Desc: United Zinc No. 1 site sampling
City: Iola **State:** Kansas
Program: Superfund
Site Name: United Zinc No. 1 - **Site ID:** A78Q **Site OU:** 00

Location Desc: ICP/MS sample 505 E. Garfield

External Sample Number: _____

Expected Conc: (or Circle One: Low Medium High) **Date** **Time(24 hr)**

Latitude: 37.93314° **Sample Collection: Start:** 3/21/07 17:25
Longitude: -95.39850° **End:** __/__/__ __:__

Laboratory Analyses:

Container	Preservative	Holding Time	Analysis
1 - 1 Liter Cubitainer	HNO3 to pH<2	180 Days	1 Metals in Water by ICP/MS

Sample Comments:
(N/A)

[redacted]

well for lawn & fish
160' depth.

Sample Collected By: RC

CHAIN OF CUSTODY RECORD
ENVIRONMENTAL PROTECTION AGENCY REGION VII

ACTIVITY LEADER(Print)	NAME OF SURVEY OR ACTIVITY	DATE OF COLLECTION	SHEET
P. Romerman	S. I. United Zinc #1	19,20,21 3 07 (DAY MONTH YEAR)	of

CONTENTS OF SHIPMENT

SAMPLE NUMBER EMA78Q00	TYPE OF CONTAINERS: CUBITAINER	glass BOTTLE	BOTTLE	BOTTLE	VOA SET (2 VIALS EA)	SAMPLED MEDIA: water	soil	sediment	dust	other	RECEIVING LABORATORY REMARKS/OTHER INFORMATION (condition of samples upon receipt, other sample numbers, etc.)
	NUMBERS OF CONTAINERS PER SAMPLE NUMBER										
3396-1		1					X				
2		1					X				
3		1					X				
4		1					X				
5		1					X				
6		1						X			
7		1						X			
8		1						X			
9		1						X			
10		1						X			
11		1						X			
101	1					X					
102	1					X					
103	1					X					
104	1					X					
105	1					X					
106	1					X					
107-FB	1					X					
201	1					X					
202	1					X					
203	1					X					
204	1					X					
			Nothing More to Follow.								

DESCRIPTION OF SHIPMENT	MODE OF SHIPMENT
____ PIECE(S) CONSISTING OF ____ BOX(ES)	____ COMMERCIAL CARRIER: ____
1 ICE CHEST(S): OTHER ____	____ COURIER
	X SAMPLER CONVEYED (SHIPPING DOCUMENT NUMBER)

PERSONNEL CUSTODY RECORD

RELINQUISHED BY (SAMPLER)	DATE	TIME	RECEIVED BY	REASON FOR CHANGE OF CUSTODY
[signature] SEALED UNSEALED	3/23/07	1418	R D Wiggans SEALED UNSEALED	Del. to Lab for Analysis
RELINQUISHED BY SEALED UNSEALED	DATE	TIME	RECEIVED BY SEALED UNSEALED	REASON FOR CHANGE OF CUSTODY
RELINQUISHED BY SEALED UNSEALED	DATE	TIME	RECEIVED BY SEALED UNSEALED	REASON FOR CHANGE OF CUSTODY

7-EPA-9262(Revised 5/85)

*U.S. GPO: 2002-756-917/40053

Location UZ #1 Ida, Ks Date 3-16-07 Fri.

Project / Client 0043.000

0746 STM AH arrive at C.P. 40° and sunny expect upper 50's. ER will be at same properties as last afternoon. Find the Resample field sheets and print and finish up video and pictures.

0840 Arrive at 602 S. 4th to collect confirmation sample from C#1 of <350 ok at 12" depth

0928 Arrive at 716 S. Chestnut to collect confirmation sample from C#3 of <500 at 12" depth

0943 At CP. to grab some files and look up phone # for Allen ER foreman

1018 Arrive at 716 S. Chestnut to collect confirmation sample @ 16" depth from C#2 of <400

1032 Arrive at EPA/ER Office and put picture on computer and misc office work.

1130 Arrive @ 302 North St. (437) to check C#1 for ER Crew. Abt of tree roots

1158 Lunch

1230 Arrive @ 302 North St @ 6" depth <400

1301 Arrive @ 716 S Chestnut for Confirmation Sample C#1 @ 12" depth <410

1330 Leave site for KC. Andrew Hauer 3-16-07

Location UZ #1 Ida, Ks Date 3-19-07 Mon.

Project / Client 0043.000

0740 STM A. Hauer leaves for C.P.

0915 At C.P. ready XRF and head to check ER Crews.

0920 Arrive at 301 North St. (1290) to check yard. At 12" depth <350 but where old sidewalk may need to be deeper

0945 Arrive at 302 North St (437) to collect confirmation sample from C#1 at 6" depth due to entire yard full of roots and gas line in easement of 402.

1030 Arrive back at 301 North St. to check progress a few spots needed dug to 18" depth

1056 OSC Stops and asks if AH would go to 502 S. Walnut to get Access.

1109 AH arrives at 502 S Walnut to get Access

1155 At 305 North # (1292) to check exc

1234 After lunch ad @ 118 Cardinal Dr # 1515 will screen & collect Soil sample for Scoring.

1300. Collect sample # 3396-1 - Soil

1324 AH @ 218 Cardinal DR # 1340 to screen

RC 3/19/07

Location U.Z. #1 Iola, KS Date 3-19-07 Mon. cont

Project / Client 0043.000

<110

1344 - Complete: collected soil sample #3396-2

1348 - ARR @ 1010 DeWitt DR #1512 to sample.

1404 - Complete: collected soil sample #3396-3 <120

1406 - ARR @ 1002 DeWitt DR #1573

1421 - Complete: <110, collected sample #3396-4

1423 - ARR @ 720 DeWitt DR #1574 to sample

1439 - Complete: <120 collect sample 3396-5.

1502 - ARR @ 502 S. Walnut #1588 to sample

1527 - Complete: Both cells <300.

1531 - ARR @ 2505 Funston #1577 to sample

1539 - Complete: Cell <130

1540 - ARR @ 2418 Funston #1510 to sample

1603 - Complete: <130

1605 - ARR @ 2526 Funston #1509 to sample

1626 - Complete: Cell <175

1628 - ARR @ 2607 Funston #1576 to sample

1643 - Complete: Cell <100.

1703 - End of Day. 10 prop. screened more w/ lead conc. >400.

[signature]
3-19-07

Location U.Z. #1 Iola, KS Date 3-20-07 Tues

Project / Client 0043.000

0758 - STMs R C & A H @ CP to get equip light rain yesterday & overnight. T-storms predicted for today. ER exc. crews working this AM to complete properties started yesterday

0807 - ARR @ 301 North St (#1290) to check exc. Soil (post exc.) was collected from both cells, will be XRFed after it dries. Post-exc. soil sample was also collected from C#2 @ 305 North St. (#1292), it will also be dried before XRF is used. Raining STMs RC & AH will collect surface H_2O & sediment samples for Assessment Act.

1500 - Sed & soil collected from 6 locations the samples have been labeled & field sheets completed. STMs conducted search for private water wells, in & around Iola, 2 wells located, owners not home. No samples collected. No other wells were located.

1533 - Return to Hotel to conduct data management.

[signature]
3-20-07

APPENDIX C

ANALYTICAL RESULTS

United States Environmental Protection Agency
Region 7
901 N. 5th Street
Kansas City, KS 66101

Date:

Subject: Transmittal of Sample Analysis Results for ASR #: 3396

Project ID: EMA78Q00

Project Description: United Zinc No. 1 site sampling

From: Dale I. Bates, Director
Regional Laboratory, Environmental Services Division

To: Eddie McGlasson
SUPR/ER&R

Enclosed are the analytical data for the above-referenced Analytical Services Request (ASR) and Project. The Regional Laboratory has reviewed and verified the results in accordance with procedures described in our Quality Manual (QM). In addition to all of the analytical results, this transmittal contains pertinent information that may have influenced the reported results and documents any deviations from the established requirements of the QM.

Please contact us within 14 days of receipt of this package if you determine there is a need for any changes. Please complete the enclosed Customer Satisfaction Survey and Data Disposition/Sample Release memo for this ASR as soon as possible. The process of disposing of the samples for this ASR will be initiated 30 days from the date of this transmittal unless an alternate release date is specified on the Data Disposition/Sample Release memo.

If you have any questions or concerns relating to this data package, contact our customer service line at 913-551-5295.

Enclosures

cc: Analytical Data File.

Project Manager: Eddie McGlasson **Org:** SUPR/ER&R **Phone:** 913-551-7756

Project ID: EMA78Q00

Project Desc: United Zinc No. 1 site sampling

Location: Iola **State:** Kansas **Program:** Superfund

Site Name: United Zinc No. 1 - **Site ID:** A78Q **Site OU:** 00

Purpose: Site Characterization **GPRA PRC:** 302DC6C

Site Investigation sampling event.

Explanation of Codes, Units and Qualifiers used on this report

Sample QC Codes: QC Codes identify the type of sample for quality control purpose.

__ = Field Sample
FB = Field Blank

Units: Specific units in which results are reported.

mg/kg = Milligrams per Kilogram
ug/L = Micrograms per Liter

Data Qualifiers: Specific codes used in conjunction with data values to provide additional information on the quality of reported results, or used to explain the absence of a specific value.

(Blank)= Values have been reviewed and found acceptable for use.
J = The identification of the analyte is acceptable; the reported value is an estimate.
U = The analyte was not detected at or above the reporting limit.
UJ = The analyte was not detected at or above the reporting limit. The reporting limit is an estimate.

ASR Number: 3396 **Sample Information Summary** **04/18/2007**

Project ID: EMA78Q00 **Project Desc:** United Zinc No. 1 site sampling

Sample No	QC Code	Matrix	Location Description	External Sample No	Start Date	Start Time	End Date	End Time	Receipt Date
1 -	__	Solid	EPA 1515, Cell #1 (118 Cardinal Drive)		03/19/2007	13:00			03/26/2007
2 -	__	Solid	EPA 1340, Cell #1 (218 Cardinal Drive)		03/19/2007	13:35			03/26/2007
3 -	__	Solid	EPA 1512, Cell #1 (1010 Dewitt Drive)		03/19/2007	14:00			03/26/2007
4 -	__	Solid	EPA 1573, Cell #1 (1002 Dewitt Drive)		03/19/2007	14:15			03/26/2007
5 -	__	Solid	EPA 1574, Cell #1		03/19/2007	14:33			03/26/2007
6 -	__	Solid	Background sample (North of Hwy 54 just West of Road 1800)		03/20/2007	09:45			03/26/2007
7 -	__	Solid	Locaton #1 (South of NE Road on West side of Hwy 169)		03/20/2007	09:15			03/26/2007
8 -	__	Solid	Location #2 (Rock Creek/South of Hwy 54 on West side of Hwy 169)		03/20/2007	09:31			03/26/2007
9 -	__	Solid	Location #3 (Rock Creek/East of Tenth Street on South side of Clarence Street)		03/20/2007	10:06			03/26/2007
10 -	__	Solid	Location #4 (Elm Creek/South end of Kentucky Street)		03/20/2007	10:20			03/26/2007
11 -	__	Solid	Location #5 (Elm Creek/South end of Colborn Street)		03/20/2007	10:53			03/26/2007
101 -	__	Water	Background sample (Rock Creek/North of Hwy 54, West of Road 1800)		03/20/2007	09:45			03/26/2007
102 -	__	Water	Location #1 (South of NE Road on West side of Hwy 169)		03/20/2007	09:15			03/26/2007
103 -	__	Water	Location #2 (Rock Creek/South of Hwy 54 on West side of Hwy 169)		03/20/2007	09:31			03/26/2007
104 -	__	Water	Location #3 (Rock Creek/East of Tenth Street on South side of Clarence Street)		03/20/2007	10:26			03/26/2007
105 -	__	Water	Location #4 (Elm Creek/South end of Kentucky Street)		03/20/2007	10:20			03/26/2007
106 -	__	Water	Location #5 (Elm Creek/South end of Colborn Street)		03/20/2007	10:53			03/26/2007
107 -	FB	Water	ICP Field Blank sample		03/20/2007	14:10			03/26/2007
201 -	__	Water	Inlet sample (Neosho River near intake)		03/21/2007	09:48			03/26/2007
202 -	__	Water	Boat Ramp sample (Upstream from intake on Neosho River)		03/21/2007	09:53			03/26/2007
203 -	__	Water	Neosho River Background sample		03/21/2007	10:13			03/26/2007
204 -	__	Water	ICP/MS sample (Hoffmeier, 505 East Garfield)		03/21/2007	17:25			03/26/2007

Analysis	Comments About Results For This Analysis

1 Metals in Solids by ICP

Lab: Contract Lab Program (Out-Source)

Method: CLP Statement of Work

Samples: 1-__ 2-__ 3-__ 4-__ 5-__ 6-__ 7-__ 8-__ 9-__ 10-__ 11-__

Comments:

Slight arsenic contamination was found in the preparation and calibration blanks. Only samples containing this analyte at a level greater than ten times the contamination level of the blank are reported without being qualified. All samples that contained this analyte but at a level less than ten times the contamination in the blank have the result U-coded indicating that the reporting limit has been raised to the level found in the sample. Samples affected were: arsenic in -1, -2, -4, -6, -10, and -11.

1 Metals in Water by ICP

Lab: Contract Lab Program (Out-Source)

Method: CLP Statement of Work

Samples: 101-__ 102-__ 103-__ 104-__ 105-__ 106-__ 107-FB

Comments:

Arsenic in samples -101 through -107FB was UJ-coded. This analyte was not found in the samples at or above the reporting limits, however, the reporting limits are an estimate (UJ-coded) due to negative recovery of this analyte in the interference check samples (ICS) which was not present in the ICS solution but whose absolute value was greater than the method detection limit (MDL), therefore, a possibility of false negatives exists. The actual reporting limits may be higher than the reported values.

Lead was UJ-coded in samples -101 through -103 and -105 through -107FB and lead was J-coded in sample -104. Positive results were J-coded and non-detect results were UJ-coded due to low recovery of this analyte in the performance evaluation (PE) sample. The actual reporting limit for this analyte may be higher than the reported value.

1 Metals in Water by ICP/MS

Lab: Contract Lab Program (Out-Source)

Method: CLP Statement of Work

Samples: 201-__ 202-__ 203-__ 204-__

Comments:

Slight arsenic contamination was found in the preparation and calibration blanks. Only samples containing this analyte at a level greater than ten times the contamination level of the blank are reported without being qualified. All samples that contained this analyte but at a level less than ten times the contamination in the blank have the result U-coded indicating that the reporting limit has been raised to the level found in the sample. Samples affected were: arsenic in -201 and -202.

ASR Number: 3396 **RLAB Approved Sample Analysis Results** **04/18/2007**

Project ID: EMA78Q00 **Project Desc:** United Zinc No. 1 site sampling

Analysis/ Analyte	Units	1-__	2-__	3-__	4-__
1 Metals in Solids by ICP					
Arsenic	mg/kg	4.17 U	4.42 U	5.09	3.89 U
Lead	mg/kg	41.7	122	25.3	21.0

ASR Number: 3396 **RLAB Approved Sample Analysis Results** **04/18/2007**

Project ID: EMA78Q00 **Project Desc:** United Zinc No. 1 site sampling

Analysis/ Analyte	Units	5-__	6-__	7-__	8-__
1 Metals in Solids by ICP					
Arsenic	mg/kg	7.22	2.57 U	4.48	1.98 U
Lead	mg/kg	52.0	27.2	56.2	57.2

ASR Number: 3396 **RLAB Approved Sample Analysis Results** **04/18/2007**

Project ID: EMA78Q00 **Project Desc:** United Zinc No. 1 site sampling

Analysis/ Analyte	Units	9-__	10-__	11-__	101-__
1 Metals in Solids by ICP					
Arsenic	mg/kg	27.3	2.12 U	3.24 U	
Lead	mg/kg	1100	144	163	
1 Metals in Water by ICP					
Arsenic	ug/L				10.0 UJ
Lead	ug/L				10.0 UJ

ASR Number: 3396 **RLAB Approved Sample Analysis Results** **04/18/2007**

Project ID: EMA78Q00 **Project Desc:** United Zinc No. 1 site sampling

Analysis/ Analyte	Units	102-__	103-__	104-__	105-__
1 Metals in Water by ICP					
Arsenic	ug/L	10.0 UJ	10.0 UJ	10.0 UJ	10.0 UJ
Lead	ug/L	10.0 UJ	10.0 UJ	16.8 J	10.0 UJ

ASR Number: 3396 **RLAB Approved Sample Analysis Results** **04/18/2007**

Project ID: EMA78Q00 **Project Desc:** United Zinc No. 1 site sampling

Analysis/ Analyte	Units	106-__	107-FB	201-__	202-__
1 Metals in Water by ICP					
Arsenic	ug/L	10.0 UJ	10.0 UJ		
Lead	ug/L	10.0 UJ	10.0 UJ		
1 Metals in Water by ICP/MS					
Arsenic	ug/L			2.96 U	2.76 U
Lead	ug/L			2.25	1.95

ASR Number: 3396 **RLAB Approved Sample Analysis Results** **04/18/2007**

Project ID: EMA78Q00 **Project Desc:** United Zinc No. 1 site sampling

Analysis/ Analyte	Units	203-__	204-__
1 Metals in Water by ICP/MS			
Arsenic	ug/L	4.38	1.00 U
Lead	ug/L	6.45	1.00 U

HRS Analysis Results Supplement

04/26/2007

ASR Number: 3396

This report supplements the information contained in the Transmittal of Sample Analysis Results for ASR 3396 sent to Eddie McGlasson on 04/18/2007 for: EMA78Q00 - United Zinc No. 1 site sampling. The transmittal contains the explanation of codes, units, and qualifiers; sample information; analysis information and comments; and the analytical results. The RL in this supplement is the laboratory's reporting limit for that analyte with any dilution factor, volume adjustment, or percent solids for that sample analysis taken into account and is sometimes called the sample quantitation limit, SQL.

Sample	Analysis / Analyte		Units	Result	RL
1-__	1	Metals in Solids by ICP			
		Arsenic	mg/kg	4.17 U	1.18
		Lead	mg/kg	41.7	1.18
2-__	1	Metals in Solids by ICP			
		Arsenic	mg/kg	4.42 U	1.24
		Lead	mg/kg	122	1.24
3-__	1	Metals in Solids by ICP			
		Arsenic	mg/kg	5.09	1.12
		Lead	mg/kg	25.3	1.12
4-__	1	Metals in Solids by ICP			
		Arsenic	mg/kg	3.89 U	1.11
		Lead	mg/kg	21.0	1.11
5-__	1	Metals in Solids by ICP			
		Arsenic	mg/kg	7.22	1.19
		Lead	mg/kg	52.0	1.19
6-__	1	Metals in Solids by ICP			
		Arsenic	mg/kg	2.57 U	1.47
		Lead	mg/kg	27.2	1.47
7-__	1	Metals in Solids by ICP			
		Arsenic	mg/kg	4.48	1.86
		Lead	mg/kg	56.2	1.86
8-__	1	Metals in Solids by ICP			
		Arsenic	mg/kg	1.98 U	1.98
		Lead	mg/kg	57.2	1.98
9-__	1	Metals in Solids by ICP			
		Arsenic	mg/kg	27.3	1.56
		Lead	mg/kg	1100	1.56
10-__	1	Metals in Solids by ICP			
		Arsenic	mg/kg	2.12 U	1.89
		Lead	mg/kg	144	1.89
11-__	1	Metals in Solids by ICP			

Sample	Analysis / Analyte		Units	Result	RL
11-__	1	Metals in Solids by ICP			
		Arsenic	mg/kg	3.24 U	1.56
		Lead	mg/kg	163	1.56
101-__	1	Metals in Water by ICP			
		Arsenic	ug/L	10.0 UJ	10.0
		Lead	ug/L	10.0 UJ	10.0
102-__	1	Metals in Water by ICP			
		Arsenic	ug/L	10.0 UJ	10.0
		Lead	ug/L	10.0 UJ	10.0
103-__	1	Metals in Water by ICP			
		Arsenic	ug/L	10.0 UJ	10.0
		Lead	ug/L	10.0 UJ	10.0
104-__	1	Metals in Water by ICP			
		Arsenic	ug/L	10.0 UJ	10.0
		Lead	ug/L	16.8 J	10.0
105-__	1	Metals in Water by ICP			
		Arsenic	ug/L	10.0 UJ	10.0
		Lead	ug/L	10.0 UJ	10.0
106-__	1	Metals in Water by ICP			
		Arsenic	ug/L	10.0 UJ	10.0
		Lead	ug/L	10.0 UJ	10.0
107-FB	1	Metals in Water by ICP			
		Arsenic	ug/L	10.0 UJ	10.0
		Lead	ug/L	10.0 UJ	10.0
201-__	1	Metals in Water by ICP/MS			
		Arsenic	ug/L	2.96 U	1.00
		Lead	ug/L	2.25	1.00
202-__	1	Metals in Water by ICP/MS			
		Arsenic	ug/L	2.76 U	1.00
		Lead	ug/L	1.95	1.00
203-__	1	Metals in Water by ICP/MS			
		Arsenic	ug/L	4.38	1.00
		Lead	ug/L	6.45	1.00
204-__	1	Metals in Water by ICP/MS			
		Arsenic	ug/L	1.00 U	1.00
		Lead	ug/L	1.00 U	1.00

APPENDIX D

RESIDENTIAL PROPERTY SCREENING FORM

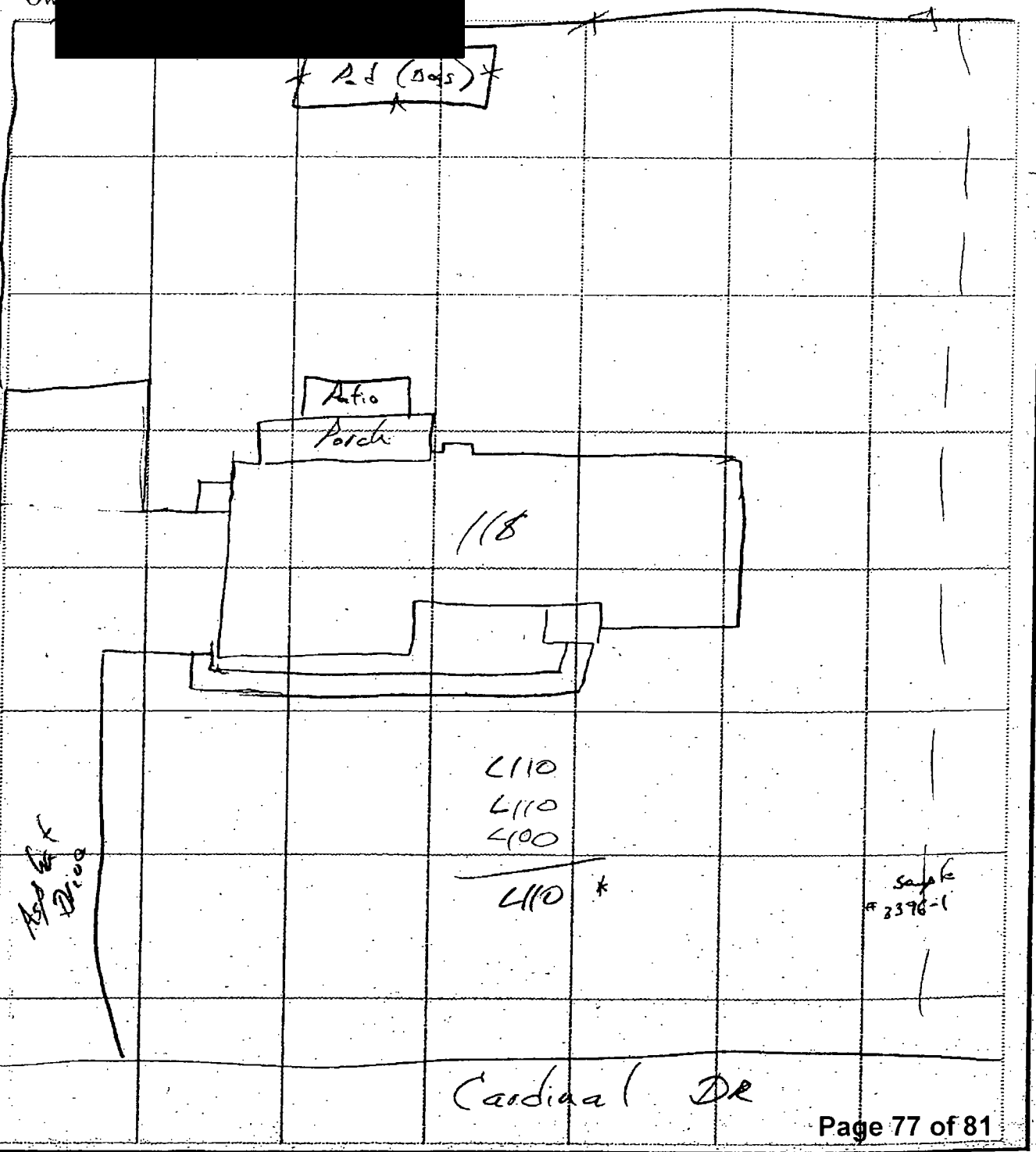
United Zinc # 1
Residential Property Screening Form
EPA Site # 1515

Date(s): 3-19-07

[redacted]

	XRF I.D.	Operator
Screening Results:	62	AH
Post-Removal:		

Latitude [redacted]
Longitude



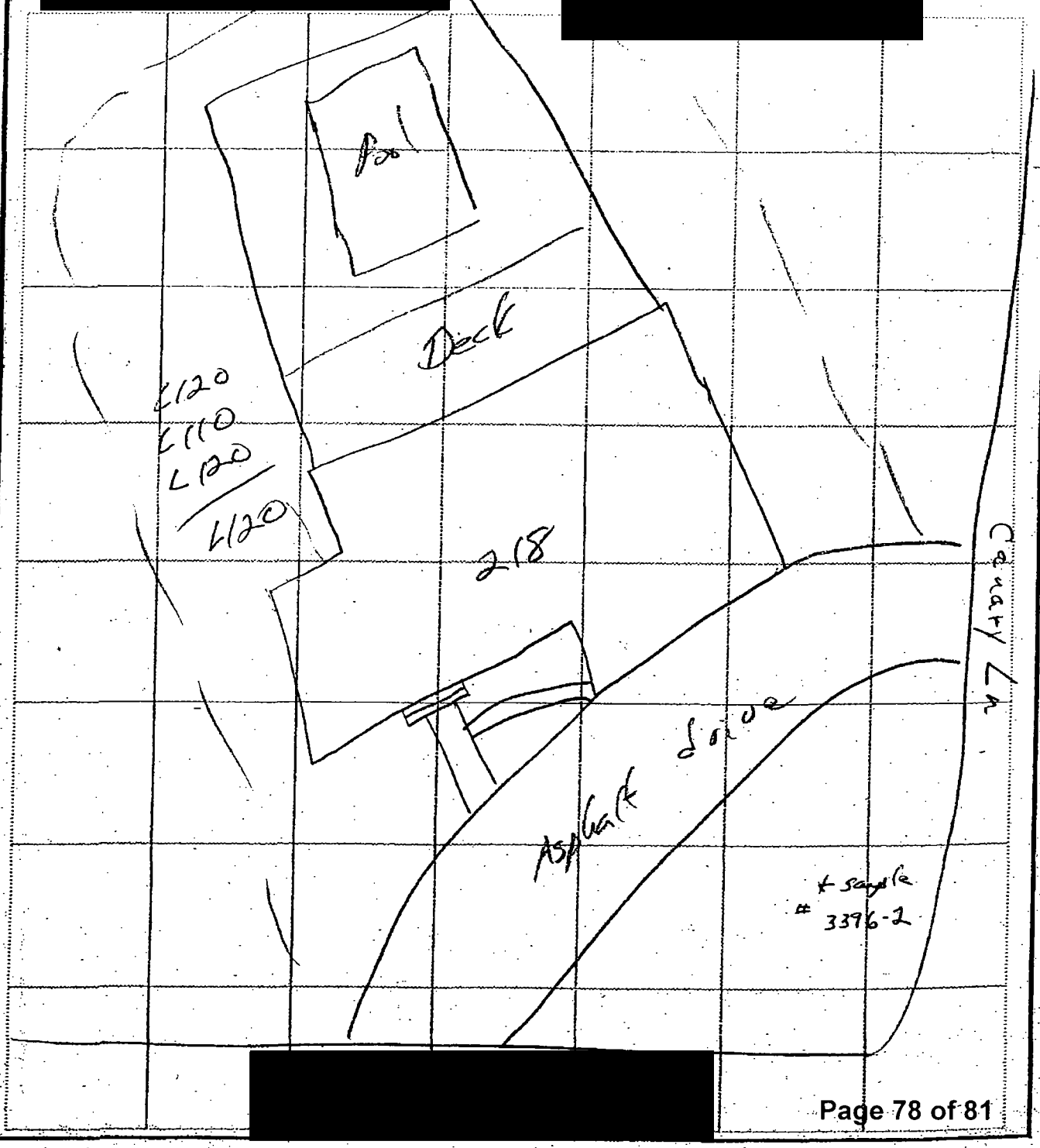
United Zinc # 1
Residential Property Screening Form
EPA Site # 1340

Date(s): 3/19/07

[redacted]

	XRF I.D.	Operator
Screening Results:	61	AA
Post-Removal:		

Latitu[redacted]
Longi



[redacted]

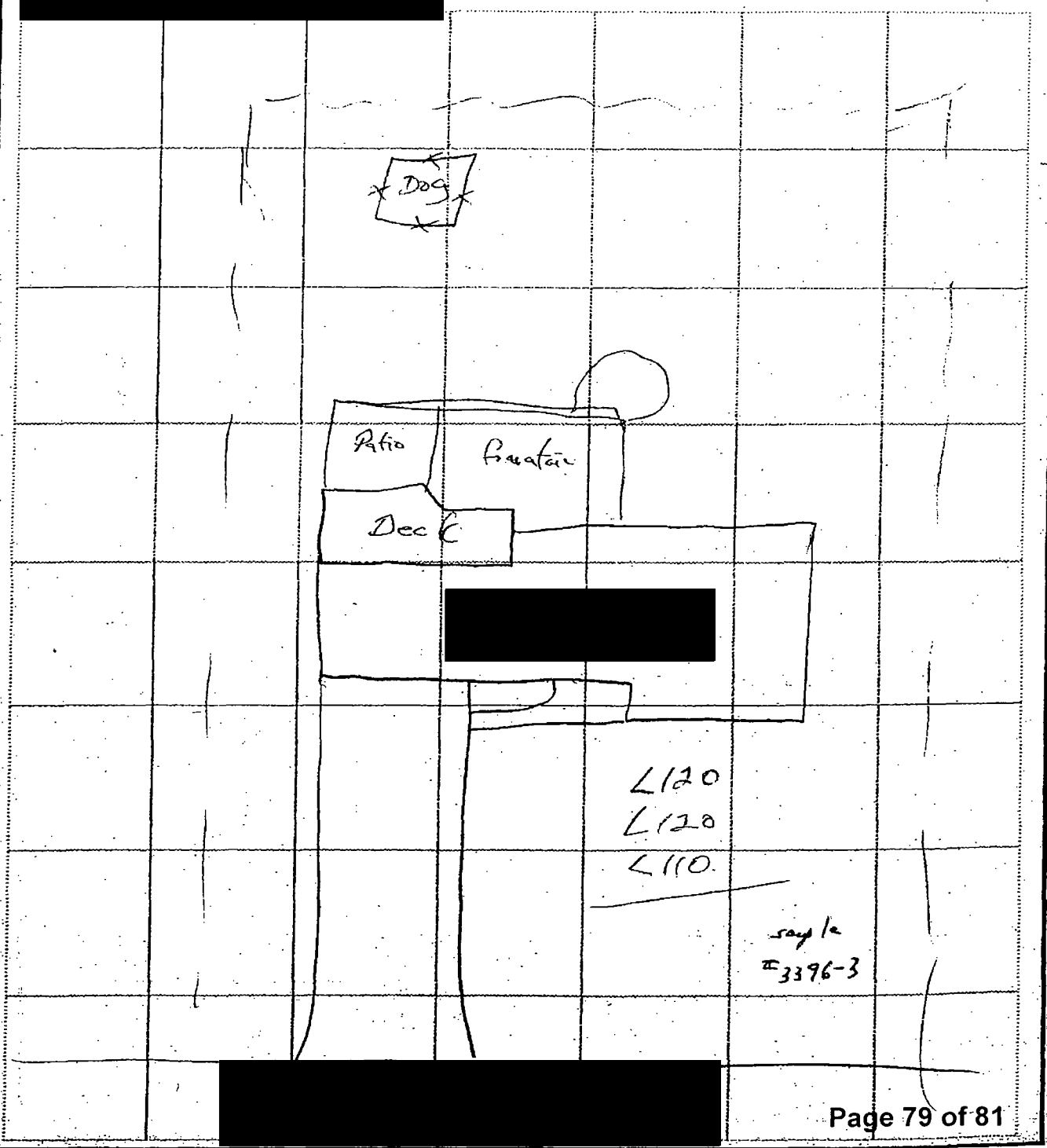
United Zinc # 1
Residential Property Screening Form
EPA Site # 1512

Date(s): 3-19-07

[redacted]

	XRF I.D.	Operator
Screening Results:	62	AK
Post-Removal:		

Latitude [redacted]
Longitu



[redacted]

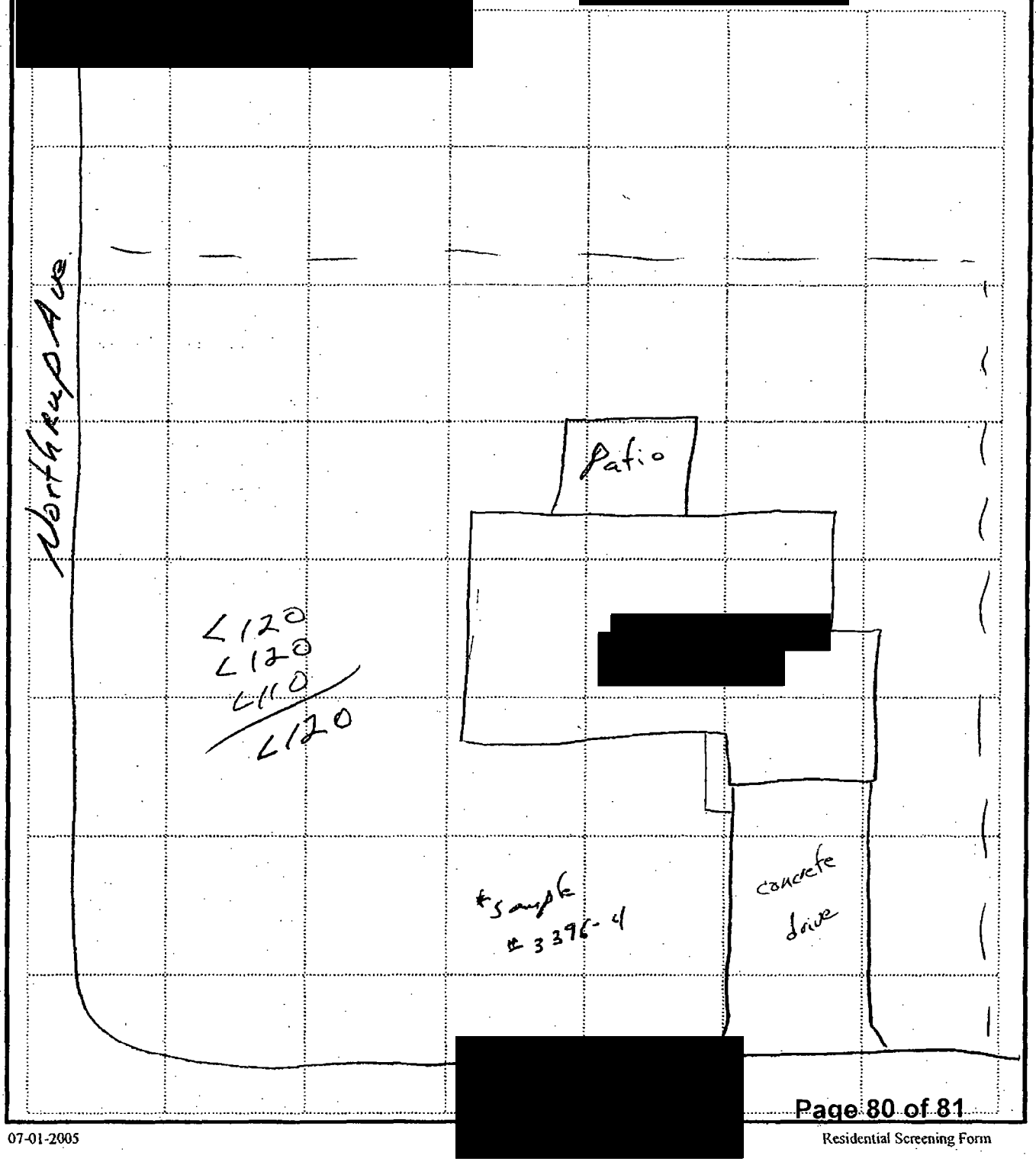
United Zinc # 1
Residential Property Screening Form
EPA Site # 1573

Date(s): 3/19/07

[redacted]

	XRF I.D.	Operator
Screening Results:	62	AH
Post-Removal:		

Latitude [redacted]
Longitu[redacted]



United Zinc # 1
Residential Property Screening Form

Date(s): 3/19/07

E[redacted]

N

A

P

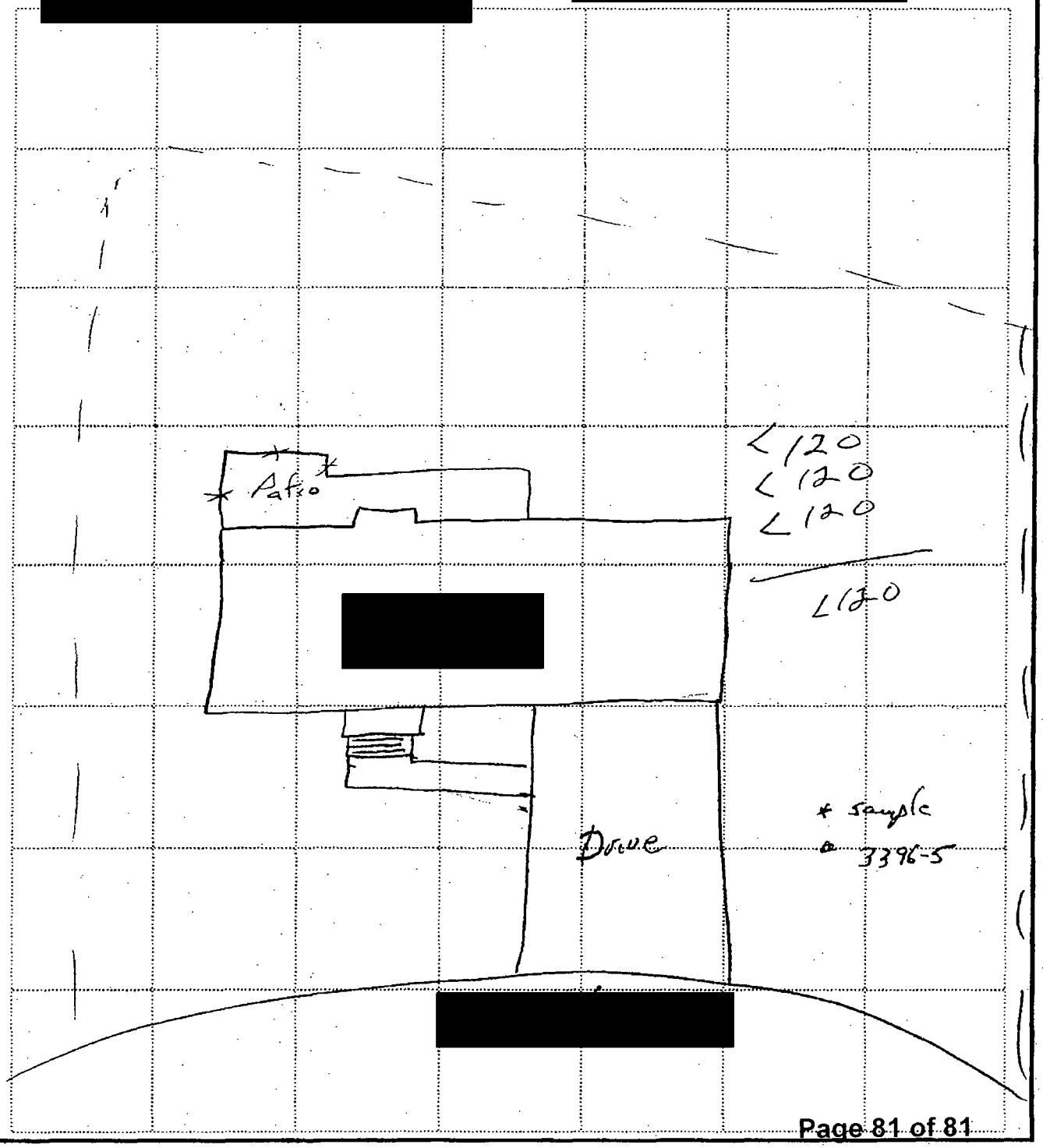
O

	XRF I.D.	Operator
Screening Results:	62	AH

Post-Removal:

Latitude [redacted]

Longitu



HRS Analysis Results Supplement

04/26/2007

ASR Number: 3396

This report supplements the information contained in the Transmittal of Sample Analysis Results for ASR 3396 sent to Eddie McGlasson on 04/18/2007 for: EMA78Q00 - United Zinc No. 1 site sampling. The transmittal contains the explanation of codes, units, and qualifiers; sample information; analysis information and comments; and the analytical results. The RL in this supplement is the laboratory's reporting limit for that analyte with any dilution factor, volume adjustment, or percent solids for that sample analysis taken into account and is sometimes called the sample quantitation limit, SQL.

Sample	Analysis / Analyte		Units	Result	RL
1-__	1	Metals in Solids by ICP			
		Arsenic	mg/kg	4.17 U	1.18
		Lead	mg/kg	41.7	1.18
2-__	1	Metals in Solids by ICP			
		Arsenic	mg/kg	4.42 U	1.24
		Lead	mg/kg	122	1.24
3-__	1	Metals in Solids by ICP			
		Arsenic	mg/kg	5.09	1.12
		Lead	mg/kg	25.3	1.12
4-__	1	Metals in Solids by ICP			
		Arsenic	mg/kg	3.89 U	1.11
		Lead	mg/kg	21.0	1.11
5-__	1	Metals in Solids by ICP			
		Arsenic	mg/kg	7.22	1.19
		Lead	mg/kg	52.0	1.19
6-__	1	Metals in Solids by ICP			
		Arsenic	mg/kg	2.57 U	1.47
		Lead	mg/kg	27.2	1.47
7-__	1	Metals in Solids by ICP			
		Arsenic	mg/kg	4.48	1.86
		Lead	mg/kg	56.2	1.86
8-__	1	Metals in Solids by ICP			
		Arsenic	mg/kg	1.98 U	1.98
		Lead	mg/kg	57.2	1.98
9-__	1	Metals in Solids by ICP			
		Arsenic	mg/kg	27.3	1.56
		Lead	mg/kg	1100	1.56
10-__	1	Metals in Solids by ICP			
		Arsenic	mg/kg	2.12 U	1.89
		Lead	mg/kg	144	1.89
11-__	1	Metals in Solids by ICP			

ASR Number: 3396 **HRS Analysis Results Supplement** 04/26/2007

Sample	Analysis / Analyte		Units	Result	RL
11-__	1	Metals in Solids by ICP			
		Arsenic	mg/kg	3.24 U	1.56
		Lead	mg/kg	163	1.56
101-__	1	Metals in Water by ICP			
		Arsenic	ug/L	10.0 UJ	10.0
		Lead	ug/L	10.0 UJ	10.0
102-__	1	Metals in Water by ICP			
		Arsenic	ug/L	10.0 UJ	10.0
		Lead	ug/L	10.0 UJ	10.0
103-__	1	Metals in Water by ICP			
		Arsenic	ug/L	10.0 UJ	10.0
		Lead	ug/L	10.0 UJ	10.0
104-__	1	Metals in Water by ICP			
		Arsenic	ug/L	10.0 UJ	10.0
		Lead	ug/L	16.8 J	10.0
105-__	1	Metals in Water by ICP			
		Arsenic	ug/L	10.0 UJ	10.0
		Lead	ug/L	10.0 UJ	10.0
106-__	1	Metals in Water by ICP			
		Arsenic	ug/L	10.0 UJ	10.0
		Lead	ug/L	10.0 UJ	10.0
107-FB	1	Metals in Water by ICP			
		Arsenic	ug/L	10.0 UJ	10.0
		Lead	ug/L	10.0 UJ	10.0
201-__	1	Metals in Water by ICP/MS			
		Arsenic	ug/L	2.96 U	1.00
		Lead	ug/L	2.25	1.00
202-__	1	Metals in Water by ICP/MS			
		Arsenic	ug/L	2.76 U	1.00
		Lead	ug/L	1.95	1.00
203-__	1	Metals in Water by ICP/MS			
		Arsenic	ug/L	4.38	1.00
		Lead	ug/L	6.45	1.00
204-__	1	Metals in Water by ICP/MS			
		Arsenic	ug/L	1.00 U	1.00
		Lead	ug/L	1.00 U	1.00

5

Kansas Department of Health and Environment
Bureau of Environmental Remediation
Identified Sites List Information

Project Code:	C300100341	**Site Status:**	Active
Site Name:	LANYON #1 AND #2		
CERCLIS Number:	KSD091356857		
Other Names:	IMP BOATS, IOLA		
Address:	500 W LINCOLN ROAD 66749	**City:**	IOLA
County:	AL	**River Basin:**	Neosho
Latitude:	37.92716	**Longitude:**	-95.41287
Program Name:	State Cooperative	**Project Manager:**	CRUISE, N.
Contaminants:	Heavy Metal		

Site Narrative:

The Lanyon Zinc Company had a smelter at the site in the late 1890s and the early 1900s. After 1925, portions of the site were owned by various companies. IMP Boats once constructed fiberglass boats at the site. An Environmental Risk Assessment was performed at the site in November 1990 to document the condition of the site. Multiple investigations were conducted to further investigate and delineate the smelter waste at the site. Lead, cadmium, and zinc were detected at concentrations above KDHE RSK levels.

A PRP has been identified and a notification letter has been sent. PRP negotiations are currently underway.

Legal Description:

Township	Range	Section	Parcel	Description
24	18E	27		SE of the NE of the SW of the NW

Actions Completed:

Activity Type	Activity	Start	Completed
PRP IDENTIFICATION/NEGOTIATION	Consent Order		05/13/1997

Actions Underway:

Activity Type	Activity	Start	Completed

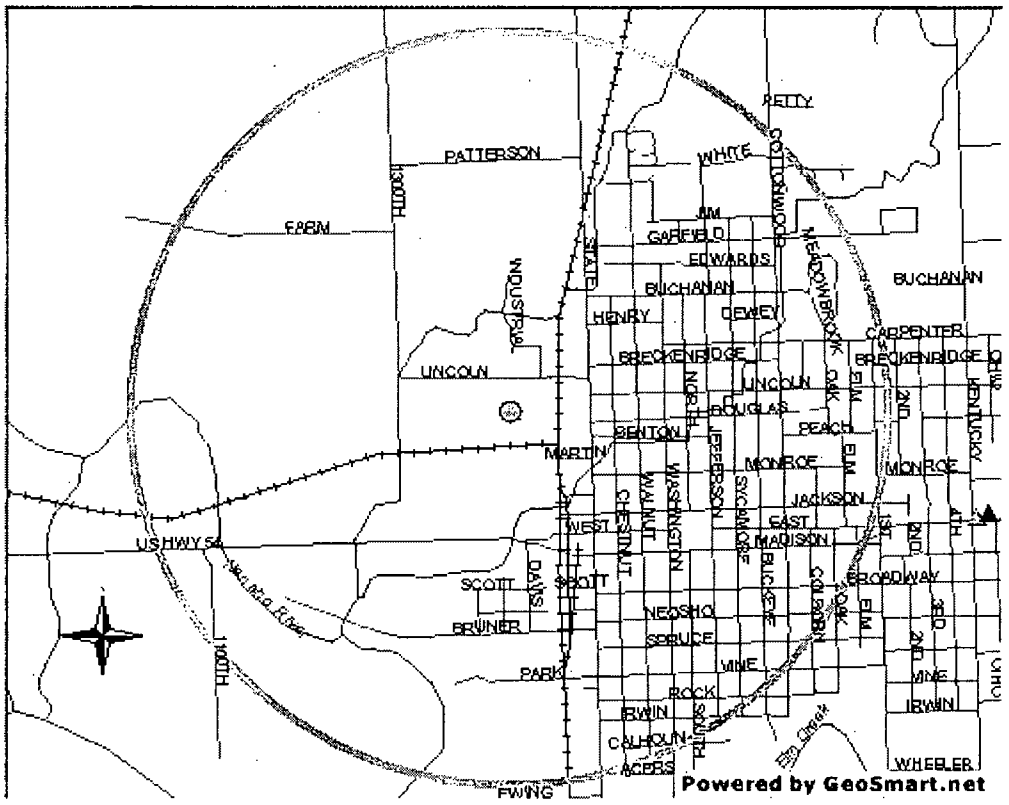
Actions Proposed:

Activity Type	Activity	Start	Completed

Environmental Use Control In Place? No

Map of Identified Site
(One-mile radius circle around selected site)

Click here for interactive map.



Types of Sites in Area

Selected Site

Active Resolved Resolved with Restrictions Transferred out of Bureau

TETRA TECH EM INC.

February 28, 2007

Mr. Roy Crossland
START Project Officer
U.S. Environmental Protection Agency, Region 7
901 North 5th Street
Kansas City, Kansas 66101

6

Subject: Quality Assurance Project Plan
United Zinc No. 1, Iola, Kansas
U.S. EPA Region 7, START 3, Contract No. EP-S7-06-01
Task Order No. 0038.000
Task Monitor: Paul Roemerman, EPA Site Assessment Team Leader

Dear Mr. Crossland:

Tetra Tech EM Inc. is submitting the attached Quality Assurance Project Plan for additional Removal Site Evaluation activities at the United Zinc No. 1 site in Iola, Kansas. If you have any questions or comments, please contact me at (913) 495-3920.

Sincerely,

Stephanie Luebbering, CHMM
START Project Manager

Ted Faile, PG, CHMM
START Program Manager

Enclosures

8030 Flint Street, Lenexa, KS 66214
Tel 913.894.2600 Fax 913.894.6295
www.ttemi.com

X9004.06.0038.000

QUALITY ASSURANCE PROJECT PLAN
FOR ADDITIONAL REMOVAL SITE EVALUATION ACTIVITIES
UNITED ZINC NO. 1
IOLA, KANSAS

CERCLIS ID: KSN000705026

Superfund Technical Assessment and Response Team (START) 3
Contract No. EP-S7-06-01, Task Order 0038.000

Prepared For:

U.S. Environmental Protection Agency
Region 7
Superfund Division
901 North 5th Street
Kansas City, Kansas 66101

February 28, 2007

Prepared By:
Tetra Tech EM Inc.
8030 Flint Street
Lenexa, Kansas 66214
913-894-2600

CONTENTS

Section/Table **Page**

QUALITY ASSURANCE PROJECT PLAN FORM 1

TABLE 1: SAMPLE SUMMARY 5

TABLE 2: DATA QUALITY OBJECTIVE SUMMARY 7

Appendices

A FIGURES

Region 7 Superfund Program
Addendum to the QAPP for Superfund Integrated Site Assessment and Targeted Brownfields Assessment Activities (July 2005)
for the United Zinc No. 1 Site

Project Information:

Site Name: United Zinc No. 1		**City:** Iola	**State:** Kansas
EPA Project Manager: Paul Roemerman		**START Project Manager:** Stephanie Luebbering	
Approved By:	Stephanie Luebbering	**Prepared For:** EPA Region 7 Superfund Division	
Title:	START Project Manager	**Date:** 2/28/07	
Approved By:			
Title:	START Program Manager	**Date:** 2/28/07	
Approved By:	Kathleen Homes	**Prepared By:** Stephanie Luebbering	
Title:	START QA Manager	**Date:**	**Date:** 2/27/2007
Approved By:			
Title:	EPA Project Manager	**Date:**	
Approved By:		**Tetra Tech START Project Number:** X9004.06.0038.000	
Title:	EPA Region 7 QA Coordinator	**Date:**	

1.0 Project Management:

1.1 Distribution List

EPA—Region 7: Paul Roemerman, EPA Project Manager
Diane Harris, EPA Region 7 QA Coordinator

Tetra Tech START: Stephanie Luebbering, Project Manager

1.2 Project/Task Organization

Paul Roemerman, of the EPA Region 7 Superfund Division, will serve as the EPA project manager for the activities described in this QAPP. Stephanie Luebbering, of Tetra Tech EM Inc. (Tetra Tech), will serve as the START project manager.

1.3 Problem Definition/Background:

Description: This site-specific Quality Assurance Project Plan form is prepared as an addendum to the Generic **Quality Assurance Project Plan for Superfund Integrated Assessment and Targeted Brownfields Assessment Program (updated July 2005)**, and contains site-specific data quality objectives for the sampling activities described herein.

☒ Description attached.

☐ Description in referenced report: _____ Title _____ Date

1.4 Project/Task Description:

☐ CERCLA PA ☐ CERCLA SI ☐ Brownfields Assessment
☒ Other (description attached): ☐ Pre-CERCLIS Site Screening ☐ Removal Assessment

Schedule: Field work is scheduled for March 2007.

☐ Description in referenced report: _____ Title _____ Date

1.5 Quality Objectives and Criteria for Measurement Data:

a. Accuracy:	☒ Identified in attached table.
b. Precision:	☒ Identified in attached table.
c. Representativeness:	☒ Identified in attached table.
d. Completeness*:	☒ Identified in attached table.
e. Comparability:	☒ Identified in attached table.

Other Description:

*A completeness goal of 100 percent has been established for this project. However, if the completeness goal is not met, EPA may still be able to make site decisions based on any or all of the remaining validated data.

1.6 Special Training/Certification Requirements:

☒ OSHA 1910 ☒ Special Equipment/Instrument Operator (describe below): Monitoring wells will be installed by a subcontractor. ☐ Other (describe below):

1.7 Documentation and Records:

☒ Field Sheets ☒ Site Log ☐ Trip Report ☒ Site Maps ☐ Video
☒ Chain of Custody ☒ Health and Safety Plan ☒ Letter Report ☒ Photos

☒ Sample documentation will follow EPA Region 7 SOP 2420.05D.
☒ Other: Analytical information will be handled according to procedures identified in Table 2.

2.0 Measurement and Data Acquisition:

2.1 Sampling Process Design:

☐ Random Sampling ☐ Transect Sampling ☒ Biased/Judgmental Sampling ☐ Stratified Random Sampling
☐ Search Sampling ☐ Systematic Grid ☐ Systematic Random Sampling ☒ Definitive Sampling
☐ Screening w/o Definitive Confirmation ☐ Screening w/ Definitive Confirmation
☒ Sample Maps Attached
☐ Other (Provide rationale behind each sample): See Attachment A for additional sampling information.

The proposed sampling scheme for groundwater from monitoring wells will be biased/judgmental, with definitive laboratory analysis, in accordance with procedures included in the *Guidance for Performing Site Inspections Under CERCLA*, OSWER Directive #9345.1-05, September 1992, and *Removal Program Representative Sampling Guidance, Volume I: Soil*, OSWER Directive 9360.4-10, November 1991. All samples will be submitted for analysis by the EPA Region 7 laboratory. See Appendix A for additional site-specific information and maps. The proposed number of samples is a balance between cost and coverage, and represents a reasonable attempt to meet the study objectives while staying within the budget constraints of a typical site investigation.

Sample Summary Location	Matrix	# of Samples*	Analysis
Private drinking water wells	Groundwater	5	Arsenic and lead
Surface water intakes	Surface water	3	Arsenic and lead
Surface soil	Soil	5	Arsenic and lead
Off-site surface water bodies	Surface water	6	Arsenic and lead
Off-site surface water bodies	Sediment	6	Arsenic and lead

*NOTE: Background/QC samples are not included with these totals. See Table 1 for a complete sample summary.

2.2 Sample Methods Requirements:

Matrix	Sampling Method	EPA Region 7 SOP(s) & Methods
Groundwater – Private drinking water wells	Groundwater samples will be collected directly into sample containers from drinking water wells at spigots/faucets closest to the well heads and prior to any treatment. The samples will be collected into appropriate containers after the wells have been purged for a minimum of 5 minutes and field water quality parameters have stabilized.	SOP 4230.10A
Surface water – Public water intakes	Surface water samples will be collected directly into sample containers from the surface water intake taps/spigots prior to any treatment. The samples will be collected into appropriate containers after the intakes have been purged for a minimum of 5 minutes and field water quality parameters have stabilized.	SOP 4230.10A
Soil	Surface soil samples will be collected with disposable stainless steel spoons and field-screened with a XRF.	SOP 4331.2012
Water – Surface water	Surface water samples will be collected directly into appropriate containers from Rock Creek, Elm Creek, and the Neosho River.	SOP 4230.17A
Sediment	Sediment samples will be co-located with the surface water samples and will be collected from the top 2 inches of stream sediment using a clean, dedicated, stainless steel spoon in a dedicated container.	SOP 4230.08A

2.3 Sample Handling and Custody Requirements:

☒ Samples will be packaged and preserved in accordance with procedures defined in Region 7 EPA SOP 2420.06D.
☒ COC will be maintained as directed by Region 7 EPA SOP 2420.04C.
☒ Samples will be accepted according to Region 7 EPA SOP 2420.01E.
☐ Other (Describe):

2.4 Analytical Methods Requirements:

☒ Identified in attached table
☒ Rationale: The requested analyses have been selected based on the historical information on the site and program experience with similar types of sites.
☐ Other (Describe):

2.5 Quality Control Requirements:

☐ Not Applicable
☒ Identified in attached table
☒ In accordance with the Generic Quality Assurance Project Plan for Superfund Integrated Assessment and Targeted Brownfields Assessment Program (updated July 2005).
☒ Field QC Samples: For this investigation, field QC samples will include a field blank prepared with DI water provided by the EPA Region 7 laboratory. The field blank will be collected to evaluate contamination of sampling containers and/or preservatives and to assess contamination potentially introduced during the sampling and laboratory procedure(s). All QC samples will be submitted for the analyses listed in the attached tables. Evaluation of blank samples depends on the levels of contamination found in environmental samples to determine whether the environmental samples are representative. Analytical results of blank samples will be evaluated on a qualitative basis by the EPA project manager and EPA contractor(s) to determine a general indication of field-introduced and/or lab-introduced contamination. Total method precision is not required for this event; therefore, field duplicates will not be collected.
☐ Other (Describe):

2.6 Instrument/Equipment Testing, Inspection, and Maintenance Requirements:

☐ Not Applicable
☒ In accordance with the Generic Quality Assurance Project Plan for Superfund Integrated Assessment and Targeted Brownfields Assessment Program (updated July 2005).
☒ Other (Describe): Testing, inspection, and maintenance of field instruments (GPS unit, water quality meter, etc.) will be performed in accordance with manufacturers' recommendations. Testing, inspection, and maintenance of laboratory equipment will be performed in accordance with the previously referenced SOPs and/or manufacturers' recommendations.

2.7 Instrument Calibration and Frequency:

☐ Not Applicable
☒ Inspection/acceptance requirements are in accordance with the Generic Quality Assurance Project Plan for Superfund Integrated Assessment and Targeted Brownfields Assessment Program (updated July 2005).
☒ Calibration of laboratory equipment will be performed as described in the previously referenced SOPs and/or manufacturers' recommendations.
☒ Other (Describe): Calibration of field instruments (water quality meter, etc.) will be performed daily, as described in the manufacturers' recommendations.

2.8 Inspection/Acceptance Requirements for Supplies and Consumables:

☐ Not Applicable
☒ In accordance with the Generic Quality Assurance Project Plan for Superfund Integrated Assessment and Targeted Brownfields Assessment Program (Updated July 2005).
☒ All sample containers will meet EPA criteria for cleaning procedures for low-level chemical analysis. Sample containers will have Level II certifications provided by the manufacturer in accordance with pre-cleaning criteria established by EPA in *Specifications and Guidelines for Obtaining Contaminant-Free Containers*.
☐ Other (Describe):

2.9 Data Acquisition Requirements:

☐ Not Applicable
☒ In accordance with the Generic Quality Assurance Project Plan for Superfund Integrated Assessment and Targeted Brownfields Assessment Program (updated July 2005).
☒ Previous data/information pertaining to the site (including other analytical data, reports, photos, maps, etc., which are referenced in this QAPP) have been compiled by EPA and/or its contractor(s) from other sources. Some of that data has not been verified by EPA and/or its contractor(s); however, the information will not be used for decision-making purposes by EPA without verification by an independent professional qualified to verify such data/information.
☐ Other (Describe):

2.10 Data Management:

☒ All laboratory data acquired will be managed in accordance with Region 7 EPA SOP 2410.01E.
☐ Other (Describe):

3.0 Assessment and Oversight:

3.1 Assessment and Response Actions:

☒ Peer Review ☒ Management Review ☐ Field Audit ☐ Lab Audit
☒ Assessment and response actions pertaining to analytical phases of the project are addressed in Region 7 EPA SOPs 2430.05C and 2430.12E.
☐ Other (Describe):

3.1A Corrective Action:

☒ Corrective actions will be taken at the discretion of the EPA project manager whenever there appear to be problems that could adversely affect data quality and/or resulting decisions affecting future response actions pertaining to the site.
☐ Other (Describe):

3.2 Reports to Management:

☐ Audit Report ☐ Data Validation Report ☐ Project Status Report ☐ None Required

☒ A letter report describing the sampling techniques, locations, problems encountered (with resolutions to those problems), and interpretation of analytical results will be prepared by START and submitted to the EPA.
☒ Reports will be prepared in accordance with the Generic Quality Assurance Project Plan for Superfund Integrated Assessment and Targeted Brownfields Assessment Program (updated July 2005).
☐ Other (Describe):

4.0 Data Validation and Usability:

4.1 Data Review, Validation, and Verification Requirements:

☐ Identified in attached table
☒ Data review and verification will be performed in accordance with the Generic Quality Assurance Project Plan for Superfund Integrated Assessment and Targeted Brownfields Assessment Program (updated July 2005).
☒ Data review and verification will be performed by a qualified analyst and the laboratory's section manager as described in Region 7 EPA SOPs 2430.05C and 2430.12E.
☐ Other (Describe):

4.2 Validation and Verification Methods:

☐ Identified in attached table
☒ The data will be validated in accordance with Region 7 EPA SOPs 2430.05C and 2430.12E.
☒ The EPA project manager will inspect the data to provide a final review. The EPA project manager will review the data, if applicable, for laboratory spikes, laboratory blanks, and the field blank to ensure that they are acceptable. The EPA project manager will also compare the sample descriptions with the field sheets for consistency and will ensure that any anomalies in the data are appropriately documented.
☐ Other (Describe):

4.3 Reconciliation with User Requirements:

☐ Identified in attached table
☒ If data quality indicators do not meet the project's requirements as outlined in this QAPP, the data may be discarded and re-sampling or re-analysis of the subject samples may be required by the EPA project manager.
☐ Other (Describe):

Region 7 Superfund Program
Addendum to the QAPP for Superfund Integrated Site Assessment and Targeted Brownfields Assessment Activities (July 2005)
for the United Zinc No. 1 Site

Table 1: Sample Summary

Site Name: United Zinc No. 1				**Location:** Iola, Kansas			
START Project Manager: Stephanie Luebbering				**Activity/ASR #:** To be determined			**Date:** February 27, 2007
No. of Samples	**Matrix**	**Location**	**Purpose**	**Depth or other Descriptor**	**Requested Analysis**	**Sampling Method**	**Analytical Method/SOP**
5	Groundwater	Private drinking water wells	To assess potential groundwater contamination from site operations	Unknown	Arsenic and lead	EPA SOP 4230.10A	EPA Method 6020
3	Drinking water from surface water source	Spigot from surface water intakes	To assess potential surface water (drinking water) contamination from site operations	Unknown	Arsenic and lead	EPA SOP 4230.10A	EPA Method 6020
5	Surface water	Surface water bodies near the site	To assess potential surface water contamination from site operations	N/A	Arsenic and lead	EPA SOP 4230.17A	EPA SOP 3122.03B
5	Sediment	Collocated with surface water samples	To assess potential sediment contamination from site operations	0-6 inches	Arsenic and lead	EPA SOP 4230.08A	EPA SOP 3122.03B
Background Samples							
1	Groundwater	Private drinking well upgradient of the site	To determine background level of contaminants of concern in groundwater	Unknown	Arsenic and lead	EPA SOP 4230.10A	EPA Method 6020
1	Drinking water from surface water source	Spigot from surface water intake upgradient of site	To determine background level of contaminants of concern in surface water (drinking water source)	Unknown	Arsenic and lead	EPA SOP 4230.10A	EPA Method 6020
5	Soil	Surface soil samples upgradient of the site	To determine background level of contaminants of concern in surface soil	0-2 inches	Arsenic and lead	EPA SOP 4231.2012	EPA SOP 3122.03B
1	Surface water	Surface water sample upgradient of the site	To determine background level of contaminants of concern in surface water	N/A	Arsenic and lead	EPA SOP 4230.17A	EPA SOP 3122.03B
1	Sediment	Co-located with surface water sample	To determine background level of contaminants of concern in sediment	0-6 inches	Arsenic and lead	EPA SOP 4230.08A	EPA SOP 3122.03B

Region 7 Superfund Program Addendum to the QAPP for Superfund Integrated Site Assessment and Targeted Brownfields Assessment Activities (July 2005) for the United Zinc No. 1 Site							
Table 1: Sample Summary (continued)							
Site Name: United Zinc No. 1				**Location:** Iola, Kansas			
START Project Manager: Stephanie Luebbering				**Activity/ASR #:** To be determined			**Date:** February 27, 2007
No. of Samples	**Matrix**	**Location**	**Purpose**	**Depth or other Descriptor**	**Requested Analysis**	**Sampling Method**	**Analytical Method/SOP**
QC Samples							
1	Water	Field blank	To assess field/laboratory-introduced contamination	N/A	Arsenic and lead	N/A	EPA Method 6020

Region 7 Superfund Program
Addendum to the QAPP for Superfund Integrated Site Assessment and Targeted Brownfields Assessment Activities (July 2005)
for the United Zinc No. 1 Site

Table 2: Data Quality Objective Summary

Site Name: United Zinc No. 1				**Location:** Iola, Kansas				
START Project Manager: Stephanie Luebbering				**Activity/ASR #:** To be determined			**Date:** February 27, 2007	
Analysis	Analytical Method	**Data Quality Measurements**					Sample Handling Procedures	Data Management Procedures
		Accuracy	Precision	Representativeness	Completeness	Comparability		
WATER (Groundwater and Surface Water)								
Arsenic and lead	see Table 1	per analytical method	per analytical method	biased/judgmental sampling based on professional judgment of the sampling team	100%; samples from private drinking water wells and surface water intakes are considered critical samples	Standardized procedures for sample collection and analysis will be used.	See Section 2.3 of QAPP form.	See Section 2.10 of QAPP form.
SOIL/SEDIMENT								
Arsenic and lead	see Table 1	per analytical method	per analytical method	biased/judgmental sampling based on professional judgment of the sampling team	100%; Soil samples from surface soil sample locations are critical samples.	Standardized procedures for sample collection and analysis will be used.	See Section 2.3 of QAPP form.	See Section 2.10 of QAPP form.

APPENDIX A

SITE-SPECIFIC INFORMATION FOR A SITE REASSESSMENT AT THE UNITED ZINC NO. 1

INTRODUCTION

The Tetra Tech EM Inc. (Tetra Tech) Superfund Technical Assessment and Response Team (START) has been tasked by the U.S. Environmental Protection Agency (EPA) Region 7 Superfund Division to conduct additional Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) Removal Site Evaluation (RSE) activities at the United Zinc No. 1 site in Iola, Allen County, Kansas.

The purpose of these activities is to determine whether any threats to human health or the environment exist as a result of releases to soil, groundwater, and surface water. This Quality Assurance Project Plan (QAPP) identifies site-specific features and addresses elements of the sampling strategy and analytical methods proposed for this investigation.

SITE LOCATION/DESCRIPTION

United Zinc is located within the city boundaries of Iola, Allen County, Kansas, on the north side of Highway 54 along Kansas Drive, and is the location of the former United Zinc and Chemical Company Zinc and Lead Smelter. The facility is located on the east side of Iola within a mixture of residential and commercial properties. United Zinc is located in Sections 25 and 36 of Township 24 South, Range 18 East (Kansas Department of Health and Environment [KDHE] 2005), as depicted on the U.S. Geological Survey (USGS) 7.5-minute topographic quadrangle map of Iola, Kansas (USGS 1984). The approximate geographic coordinates for the central portion of the facility are 37.9222800 degrees north latitude and 95.385900 degrees west longitude (Maxim Technologies, Inc. [Maxim] 2003). The location of the facility is shown in Appendix A, Figure 1.

The former United Zinc smelter facility was comprised of 10 parcels of land, equivalent to approximately 17 acres, but the overall site area evaluated includes a much larger surrounding section. The property has been graded, leveled, and developed since the former smelter operations ceased in the 1920s (Maxim 2003). Most of the property where the former smelter was located is vacant but includes the following businesses: Brenntag Southwest, Inc. (Chemical Distribution Company), a MFA Distributor, the Superflea Flea Market, Tucker's Flea Market, a portion of a concrete mixing facility, and some pastureland (Maxim 2003, KDHE 2005). The facility is bordered on the north by residential properties; on the east by the East Iola Site (the location of the former Prime Western Smelting Company Works No. 3 and J.B. Kirk Gas and Smelting Company), a car wash, a former Tyson processing facility, and a movie theater; on the south by a restaurant, a dry cleaner, a car dealership, and agricultural land; and on the west

by the Colberly Site (the location of the former United Iron Works Company), a truck repair facility, and the remaining portion of the concrete mixing facility (Maxim 2003). The facility is also surrounded by residential neighborhoods and six schools (KDHE 2005). Investigations have focused specifically on the Iola Preschool for the Exceptional (Iola Preschool) is located northeast of United Zinc, and the McKinley Elementary School (McKinley School) located southwest of United Zinc (Terranext 2005). The facility layout is shown in Appendix A, Figure 2.

According to the historic plat maps and Sanborn fire insurance maps, activities at the United Zinc facility began as early as 1901. At that time, the facility was called the Standard Acid Company and included three furnaces, 12 retorts, and a pottery room with kilns. Mr. William Lanyon owned the property between 1901 and 1902. The property was transferred to United Zinc in 1902. United Zinc and Chemical Company owned and operated the primary zinc smelter until approximately 1912. No known active smelting facilities were documented on the property after 1912. Historical documentation indicates that the United Zinc facility contained four furnaces, eight kilns, 14 retorts, and several ore crushers and roasters (KDHE 2005). The United Zinc facility was designed to capture the sulfur dioxide fumes generated during roasting the ore to make sulfuric acid; therefore, United Zinc likely used the acid chambers associated with the Standard Acid facility (KDHE 2006).

During a 2003 Phase I site reconnaissance, smelter waste was observed at United Zinc, and the quantity was estimated as approximately 1,800 cubic yards concentrated in the southwest corner of the vacant property at United Zinc (Burns & McDonnell Engineering Company Inc. [Burns & McDonnell] 2004, Terranext 2005). Zinc smelter waste is known to contain elevated concentrations of heavy metals from smelting activities—including arsenic, cadmium, lead, and zinc. Sampling of the soil, groundwater, sediment, surface water, smelter waste, and surrounding areas began in 2004 to determine the potential impact from the former smelting operations at United Zinc.

The EPA has tasked Tetra Tech to perform additional sampling as part of the RSE to determine background concentrations of arsenic and lead in the surface soil, and to identify impacts to the groundwater and surface water pathways. Investigations to identify the levels of arsenic and lead in residential yards near the former United Zinc facility are continuing under the RSE, but background concentrations in the area have yet to be defined. The additional sampling will include surface soil east of the United Zinc facility in an area without existing industrial and commercial facilities. In addition existing private drinking water wells, surface water intakes that provide drinking water to the City of Iola,

and surface water and sediment samples from Rock Creek and Elm Creek will also be collected to evaluate the surface water pathway.

ENVIRONMENTAL SETTING

Iola is located within the Upper Neosho Watershed. The City of Iola obtains their drinking water from surface water according to the EPA's Safe Drinking Water Information System. No drinking water violations have been reported for the City of Iola since October 2005. Violations noted since 1992 included exceedences of total haloacetic acids, total trihalomethanes, and total coliform. The City of Iola responded to each health based violation and compliance was achieved (EPA 2007).

Allen County is located within the Osage Plains, and the land is predominantly level with few outstanding differences in the relief of the land. The U.S. Department of Agriculture (USDA) has classified soil in the area as Kenoma silt loam. The Kenoma soil type is described by the USDA as deep, moderately well-drained, very slowly permeable soils on the uplands. These soils are formed in material weathered from sediments high in content of silt and clay (USDA 1978).

PREVIOUS INVESTIGATIONS

Previous investigations at the United Zinc facility are as follows:

- A Phase I Focused Former Smelter Assessment (FFSA) was completed on behalf of the KDHE State Water Plan (SWP) program in December 2003. The FFSA identified a Recognized Environmental Condition (REC) at United Zinc based on observation of smelter waste during the site reconnaissance. The smelter waste appeared to have impacted the vegetative growth in the area of the former smelter operations. In addition, elevated concentrations of lead had been previously documented in the surface soils on the property immediately adjacent to United Zinc from other documented smelting operations, including the East Iola Site and the Colberly Site. A Phase II Assessment was recommended at United Zinc and in the area surrounding the smelting activities to investigate the potential risk of human exposure to heavy metal-impacted waste and surface soil (Maxim 2003).

- Sampling of the soil, smelter waste, groundwater, surface water, and sediment was conducted during the Phase II FFSA at United Zinc in December 2004 on behalf of the KDHE SWP. The sampling identified elevated levels of arsenic, cadmium, lead, and zinc

above the background soil sample concentrations. The Phase II FFSA also indicated potential contamination near residents and at both the McKinley School and the Iola Preschool (Burns & McDonnell 2004, KDHE 2005).

- KDHE collected samples in June 2005 from 50 residential yards located between United Zinc and the McKinley School and the Iola Preschool. Arsenic was detected above its KDHE Risk-Based Standards for Kansas (RSK) Residential Soil Pathway level of 11 milligrams per kilogram (mg/kg) in 18 of the residential samples (Terranext 2005, KDHE 2003). In addition, lead was found above its KDHE RSK Residential Soil Pathway level of 800 mg/kg in 12 of the residential samples, some of the same samples with elevated arsenic concentrations. Cadmium and zinc were detected in all of the soil samples at concentrations below their KDHE RSK Residential Soil Pathway values (Terranext 2005, KDHE 2003, 2005).

- A Preliminary RSE was conducted by KDHE in September 2005. In support of the 2005 RSE, KDHE collected additional samples from sensitive receptors areas near United Zinc, including the McKinley School and Iola Preschool. The results exhibited elevated levels of arsenic, cadmium, lead, and zinc at residential and non-residential properties. The presence of lead above 400 mg/kg was also identified within the McKinley School playground and adjacent areas. The Preliminary RSE recommended further removal site evaluation and removal action consideration (KDHE 2005).

- Tetra Tech START, under contract to the EPA, prepared a RSE report in September 2006. The sampling activities for the RSE were conducted during April and May 2006. During the RSE, approximately 260 properties were screened for lead using a XRF, and approximately 10 percent of the screened samples were submitted for laboratory confirmation analyses of arsenic, barium, cadmium, lead, and zinc. Thirty-four properties were identified where XRF and/or laboratory data indicated lead concentrations warranted a time-critical removal action (400 mg/kg for schools and daycares; 800 mg/kg for residential properties; and 1,000 mg/kg for commercial properties). The 34 properties included 19 private residences, 10 daycare facilities, two elementary schools, and three commercial properties (Tetra Tech 2006). In addition, 65 residential samples collected during the RSE contained concentrations of lead between 400 mg/kg and 800 mg/kg.

Contaminants potentially released at the site include the following:

- Metals – according to historical documents of the zinc smelting industry, smelting operations were known to generate large amounts of soot from burning coal, which was generally contaminated with elevated levels of lead, cadmium, arsenic, and zinc. In addition, the smelting operations generated large volumes of smelter waste, including impure smelting slag and slag blown from the retorts at the end of the smelting process that also contained heavy metals.

SAMPLING STRATEGY AND METHODOLOGY

The sampling activities are tentatively scheduled to begin in March 2007, and will require approximately three days to complete. The laboratory data obtained for all samples collected during this project will be compared to all applicable or relevant and appropriate requirements (ARAR) to assess whether further response is warranted.

Groundwater Sampling

Groundwater samples will be collected from five private drinking water wells (including one background location) (see Appendix B, Figure 3). At this time, Tetra Tech START has not received permission to sample all the wells; however, the intention is to gain permission and to sample these wells. Groundwater samples from the drinking water wells will be collected from taps/spigots located nearest the well heads, prior to any treatment systems. The system lines at active wells will be purged for approximately 5 minutes before the samples are collected. Any wells not currently in use will be purged for at least 15 minutes prior to sampling. Water quality parameters (pH, conductivity, and temperature) will be recorded as each well is purged until the parameters stabilize.

A field sheet will be completed for each groundwater sample location. The field sheets will include the following information: water quality parameters, purge times or estimated purge volumes, property ownership information, exact sample locations (depths and GPS coordinates), and analyses to be performed. The groundwater samples will be submitted to the EPA Region 7 laboratory for analyses of arsenic and lead. Water samples for metals analysis will be collected in 1-liter containers and preserved with nitric acid (HNO_3) to a pH <2. All water samples will be stored in coolers maintained at or below 4 C pending submittal to the EPA Region 7 laboratory.

Surface Water Sampling

Surface water samples will be collected from three surface water intakes used by the City of Iola to provide drinking water to the City (including one background location) (see Appendix B, Figure 3). At this time, Tetra Tech START has not received permission to sample the surface water intakes; however, the intention is to gain permission and to sample these intakes. Surface water samples from the water supply intakes will be collected from taps/spigots located nearest the intake, prior to any treatment systems. The system lines at active wells will be purged for approximately 5 minutes before the samples are collected. Water quality parameters (pH, conductivity, and temperature) will be recorded as each well is purged until the parameters stabilize.

A field sheet will be completed for each surface water sample location. The field sheets will include the following information: water quality parameters, purge times or estimated purge volumes, property ownership information, exact sample locations (depths and GPS coordinates), and analyses to be performed. The surface water samples will be submitted to the EPA Region 7 laboratory for analyses of arsenic and lead. Water samples for metals analysis will be collected in 1-liter containers and preserved with nitric acid (HNO_3) to a pH <2. All water samples will be stored in coolers maintained at or below 4 C pending submittal to the EPA Region 7 laboratory.

Soil Sampling

Surface soil samples will be collected and screened in the field at approximately five residential properties to determine the background concentrations of arsenic and lead in Iola in an area east of the former United Zinc facility. At each property, after receiving consent from the owner, Tetra Tech START will divide the property into distinct cells for screening purposes. While the maximum size of a cell will be 100 by 100 feet, the actual size of cells will be determined in the field based on site features. A cell will extend from the circumference defined by the drip zone around the building or house in all directions 100 feet or to the property line, whichever distance is shorter. Additional areas or cells to be screened include: the drip zone; fine-grained material if used for driveways, sidewalks, or under carports; vegetable gardens; and children's play areas at least 25 by 25 feet. A composite sample consisting of nine aliquots, each collected from 0 to 2 inches below ground surface (bgs), will be collected in each cell and placed in a labeled, sealed plastic bag.

Three separate readings for the metals of interest will be taken of each homogenized sample using a field portable x-ray fluorescence (XRF) analyzer; these readings will be recorded in the appropriate cell on the

field sheet for that property. The average of these three readings will be calculated and also recorded on the field sheet. All of the screened samples will be collected in an 8-ounce jar and will be submitted for laboratory confirmation analyses of arsenic and lead. All soil samples will be stored in coolers maintained at or below 4° C pending submittal to the EPA Region 7 laboratory.

Surface Water and Sediment Sampling

Runoff from the former United Zinc facility drains to the east to Rock Creek. Rock Creek flows to the south and drains into Elm Creek which leads to the confluence of the Neosho River. Two drinking water intakes exist 8 miles downstream of United Zinc, on the Neosho River. Surface water and sediment samples will be collected from Rock Creek, and Elm Creek, as shown in Figure 3 in Appendix B. A background surface water and sediment sample will be collected from Rock Creek upgradient of the former United Zinc facility. At each location, the surface water sample will be collected prior to the collection of the sediment sample. Water samples will be collected by immersing the sample containers directly into the water, whenever possible. All sampling procedures will follow the guidelines established in the EPA Standard Operating Procedures (SOP) identified in the QAPP.

Surface water samples will be submitted to the EPA Region 7 laboratory for analysis of arsenic and lead. Water samples to be analyzed for total metals will be collected in 1-liter containers and preserved with HNO_3 to a pH <2.

Sediment samples will be collected from the top 6 inches of stream sediment with a disposable stainless-steel spoon. The sediment will be placed in a disposable aluminum pie pan for homogenization and then transferred to an 8-ounce jar for analysis of the metals.

Pertinent data, including analyses to be performed and sample location data, will be recorded on field sheets for each sample. All surface water and sediment samples will be stored in coolers maintained at or below 4°C pending submittal to the EPA Region 7 laboratory.

A summary of all anticipated samples for this project is in Table 1 of the attached QAPP form. A summary of data quality objective summaries for this project is in Table 2 of the attached QAPP form. The SOPs and chain-of-custody procedures referenced in the QAPP will be followed throughout the sampling activities to verify the integrity of the samples from the time of collection until they are submitted to the laboratory for analysis.

Disposal of investigation-derived wastes (IDW) and procedures for equipment and personal decontamination will be addressed in a site-specific health and safety plan prepared by Tetra Tech START. IDW is expected to consist of disposable sampling supplies (gloves, paper towels, polyvinyl chloride liners, pie pans, etc.) that will be disposed of off site as uncontaminated solid waste.

Quality Control Samples

An off-site location will be selected for collecting background samples of soil, groundwater, surface water, and surface water and sediment. To evaluate sample quality control (QC), a field blank will be collected, as specified in Section 2.5 of the QAPP form.

ANALYTICAL METHODS

All samples will be submitted to the EPA Region 7 laboratory in Kansas City, Kansas, for analysis. The water samples will be analyzed for arsenic and lead. All samples will be analyzed according to SOP and methods referenced on the QAPP form. Standard detection limits for those methods will be adequate for this project. Appropriate containers and physical/chemical preservation techniques will be employed during the field activities to help verify that representative analytical results are obtained. An Analytical Services Request form has been completed by the Tetra Tech START Project Manager and submitted to the EPA Region 7 laboratory. Submittal of samples to the laboratory is expected in March 2007.

REFERENCES

Burns & McDonnell Engineering Company Inc. (Burns & McDonnell). 2004. Phase II Focused Former Smelter Assessment of the Former United Zinc #1 Smelter in Iola, Kansas. December.

Kansas Department of Health and Environment (KDHE). 2003. Risk-Based Standards for Kansas Manual. March 1.

KDHE. 2005. Preliminary Removal Site Evaluation for United Zinc Smelter #1 Site in Iola, Kansas. September.

KDHE. 2006. Bureau of Environmental Remediation/Remedial Section – A Short History of the Zinc Smelting Industry in Kansas. December 28.

Maxim Technologies, Inc. (Maxim). 2003. Focused Former Smelter Phase I Report. Group B Smelters. United Zinc #1 in Iola, Kansas. December 19.

Terranext. 2005. Residential Yard Soil Sampling Report for United Zinc #1 in Iola, Kansas. June 27.

Tetra Tech EM Inc. (Tetra Tech). 2006. Removal Site Evaluation Report for United Zinc #1 Site. September 26.

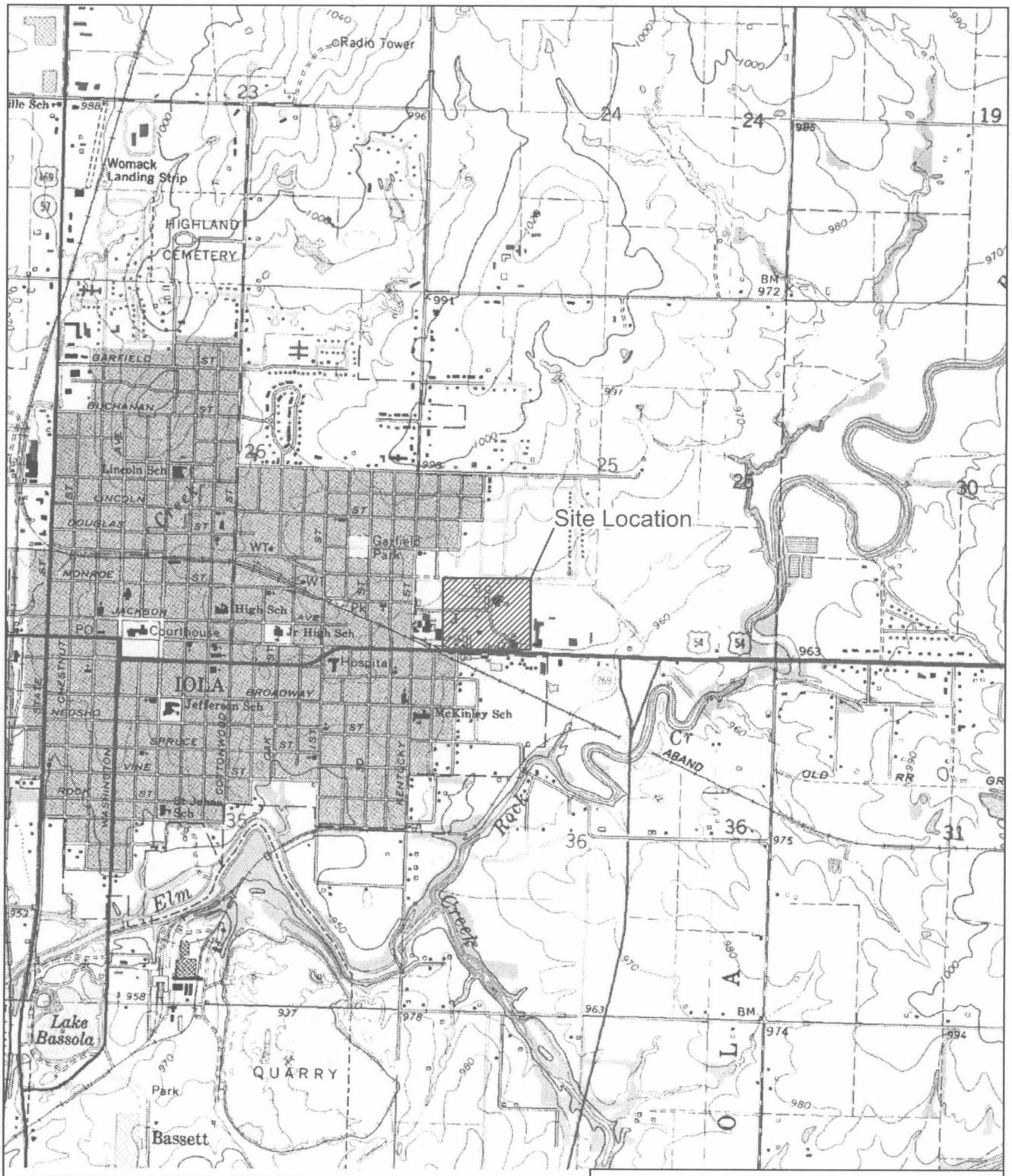
U.S. Department of Agriculture. 1978. Soil Survey of Allen County, Kansas. November.

U.S. Environmental Protection Agency. 2007. Safe Drinking Water Information System for the City of Iola. On-line Address: http://oaspub.epa.gov/enviro/sdw_report. Accessed February 26, 2007. Last updated February 26, 2007.

U.S. Geological Survey (USGS). 1984. Iola, Kansas, 7.5-minute topographic quadrangle.

APPENDIX A

FIGURES



Source: USGS Allen County, KS 7.5 Minute Topo Quad, 1959, PR 1984

X:\G9B0041003B\dwg\figure1.dwg

United Zinc Lead Site
Iola, Kansas

Figure 1
Facility Location Map

Tetra Tech EM Inc.

Date: 01/17/07 Drawn By: Bill Spiking Project No: 19004.L06.0038.000

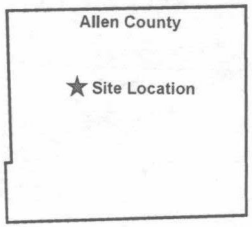
Legend
Schools
Slag Pile
Highway
Major Road
Local Road
Minor Road
Other Road
Property Boundary
County Locator
Allen County
Site Locator
Allen County
Site Location
N
0 200 400
Feet
Lincoln Elementary
Iola Preschool
Concrete Plant
Super Flea
Flea Market
Iola Senior High School
Iola Middle School
Coberly Site
East Iola Site
Flea Market
MFA
Brentags
Jefferson Elementary
Mckinley Elementary
Source: Allen Co., Kansas DOQQ Tileset, 2003
Street Maps USA-ESRI Media Kit, 2001-2005
MAXIM Technologies Inc, Figure 2 (Group B Lead Smelters), 2003
United Zinc Lead Site
Iola, Kansas
Figure 2
Facility Map
TETRA TECH EM INC.

Legend

- Domestic well sample location
- Background soil sample location
- Surface water and sediment sample location
- Public water supply site
- Contaminated soil boundary
- Property Boundary

County Locator

Site Locator



N

0 1,000 2,000

Feet

Source: Allen Co., Kansas DOQQ Tileset, 2003
Street Maps USA-ESRI Media Kit, 2001-2005
MAXIM Technologies Inc. Figure 2 (Group B Lead Smelters), 2003

United Zinc Lead Site
Iola, Kansas

Figure 3
Proposed Sample Location Map

TETRA TECH EM INC.

Date: 01/22/07 Drawn By: Colin Willis Project No. 59044.L.06.0038.000

FOCUSED FORMER SMELTER PHASE I REPORT

GROUP B SMELTERS

UNITED ZINC #1 – IOLA, KANSAS

FINAL

Prepared For:

Kansas Department of Health & Environment

Bureau of Environmental Remediation

State Water Plan

1000 SW Jackson, Suite 410

Topeka, Kansas 66612-1367

7

Theresa Ferguson

Theresa Ferguson

Geological Engineer

Roger Lamb

Roger Lamb

Senior Hydrogeologist

ROGER EDWIN LAMB LICENSED 59 KANSAS GEOLOGIST

MAXIM PROJECT NO. 3390184 DECEMBER 19, 2003

MAXIM TECHNOLOGIES INC

TABLE OF CONTENTS

1.0 INTRODUCTION 1

2.0 PROPERTY DESCRIPTION 1

2.1 United Zinc #1 Property 1
2.2 Adjoining Properties 2

3.0 PHYSICAL SETTING 3

4.0 HISTORICAL RECORDS 3

4.1 Allen County Plat Map 4
4.2 Ownership Records 4
4.3 Chain of Title Records 4
4.4 City Directories 5
4.5 Sanborn Fire Insurance Maps 5
4.6 Aerial Photography 6

5.0 REGIONAL HISTORY 7

5.1 United Zinc #1 Site Operational History 7
5.2 East Iola Site Operational History 8
5.3 Coberly Site Operational History 8

6.0 INTERVIEWS 9

7.0 ENVIRONMENTAL RECORDS SEARCH 9

8.0 PREVIOUS INVESTIGATIONS AND CORRECTIVE ACTION 13

9.0 SITE RECONNAISSANCE 14

10.0 RECEPTOR SURVEY 15

11.0 RECOGNIZED ENVIRONMENTAL CONDITIONS 18

12.0 CONCLUSIONS 19

FIGURES

1 Site Location map

2 Site and Surrounding Properties (Receptor Survey) Map

3 Site Property Map

4 1906 Allen County Plat Map (Iola, Gas, LaHarpe Area)
5 1921 Allen County Plat Map (Iola, Gas, LaHarpe Area)
6 1906 Iola Plat Map
7 1986 Aerial Photograph – United Zinc #1
8 1992 Aerial Photograph – United Zinc #1 (Terraserver)

APPENDIX

A Sanborn Maps
B Ownership Tables (Table 1)
C Chain of Title Information (Table 2)
D Kansas Geological Survey Water Well Records (Table 3, Web Records)
E EDR Package
F Site Photographs
G References
H Field Notes

1.0 Introduction

The Kansas Department of Health and Environment, in a correspondence dated February 13, 2003, has requested Maxim Technologies, Inc. (Maxim) to conduct a Focused Former Smelter Assessment (FFSA) a property located in Allen County, Kansas in the city of Iola, Kansas.

The primary objective of the FFSA is to preliminarily evaluate environmental impacts associated with former smelter properties located in Allen County, and to evaluate the implications of any identified contamination relative to current land use. Investigation activities for this Phase I Environmental Assessment included historical research to identify areas most likely to have been impacted, to identify potentially responsible parties, and to identify potential human and environmental contaminant receptors.

Historical documents were reviewed including Sanborn Fire Insurance maps, Allen County register of deeds documents, Allen County Historical Society documents and photos, and aerial photographs from the Allen County Assessor. Interviews with persons familiar with the property were also conducted in order to supplement the information obtained from the various historical reviews. Allen County Register of Deeds and Assessor's office documents were reviewed in an effort to delineate the specific locations and approximate dimensions of the former smelter operations and facilities. Copies of all maps, photos, records, etc. reviewed are provided with this assessment.

A site reconnaissance and receptor survey was also conducted for these properties to identify any potential receptors on and off-site. A visual survey of the properties and adjacent properties was conducted to document current on and off-site conditions and identify any areas of concern such as smelter waste piles and contaminant migration conduits.

Land and property in locations near the present day towns of Iola, Gas, and LaHarpe, Kansas were chosen in the early 1900's as locations to begin lead smelting operations. The discovery of numerous low cost natural gas fields in and around Iola spurred the expansion/relocation of the zinc and lead smelting business from Pittsburg, Kansas, where it was started in the Midwest and utilized coal as an energy source, to Iola, Gas, and LaHarpe. Natural gas as a fuel for smelting operations was not introduced to the Iola area until approximately 1899 to 1900. Smelter companies often purchased land nearby their smelting operations and drilled wells to produce natural gas as a fuel source. As early as 1921 smelting companies were ceasing operations after the natural gas boom came to a halt and the properties were sold and divided into individual parcels.

2.0 Property Description

2.1 United Zinc #1 Property

The United Zinc #1 (UZ1) Site is the former location of the United Zinc and Chemical Company Zinc and Lead Smelter. The site is located in Iola, Allen County, Kansas in the S ½ SW ¼ and

the SE ¼ SW ¼ of Section 25, Township 24 South, Range 18 East (Figure 1). The approximate longitude and latitude of the center of the property is Latitude North 37.922800 and Longitude West 95.385900. The UZ1 site is located on both the northwest and northeast corner of the intersection of Kansas Drive and East Street and is comprised of approximately 17 acres, and includes ten separate parcels of land, each owned by separate owners, private and commercial. All onsite smelter facilities including the furnaces and processing facilities, building foundations, and all rail lines have been removed. The property has been graded, leveled, and developed since former smelter operations ceased in the 1920s.

The subject property is located within a commercial area on the east side of Iola and is comprised of a vacant piece of property, Brentagg Southwest, Inc. (Chemical Distribution company), an MFA Distributor, the Superflea Flea Market (with associated sheds and storage buildings), Tucker's Flea Market (with associated sheds and storage buildings), a portion of a small concrete plant, and a section of pastureland containing a few abandoned structures. A drainage ditch flowing east to west separates the site from residential properties, located directly to the north. An inactive rail line is also located directly to the south of this drainage ditch and runs east to west. All rail lines and spurs have been removed and there is no existing evidence on site.

According to the Allen County Appraiser, the following areas of the UZ1 Site are zoned as follows: heavy industrial – north of Monroe Street, light industrial near the intersection of Monroe Street and Kansas Drive to the east and west, and general business west of Kansas Drive. Several entrances are located on the Site. The Site can be accessed from Monroe Street and Kansas Drive. Each individual parcel also has a private and/or public driveway associated with each. A fence surrounds a portion of the Site, north of Monroe Street, used as pastureland. Access is extremely limited to the public in this area. In the remaining portions of the site public access is unlimited.

2.2 Adjoining Properties

The East Iola and the Coberly Sites are adjacent the Site to the east and the west, respectively. The East Iola Site is the former location of the Prime Western Smelting Company Works #3 and the J.B. Kirk Gas and Smelting Company. The Coberly Site is the former location of the United Iron Works Company, depicted on Figure 6 (1906 Iola Plat Map). The Coberly Site comprises approximately 6.1 acres on the northeast corner of Kentucky Street and East Street (Hwy 54) and includes three separate parcels of land. The East Iola Site is comprised of approximately 21 acres and includes five separate parcels of land. Each is currently owned by private and/or public parties not associated with former smelter activity.

All smelter facilities including the furnaces and processing facilities, building foundations, and all rail systems have also been removed at these sites and both sites have been graded, leveled, and developed since former smelter operations ceased. Previous investigations by KDHE have been conducted on the Coberly Site and the East Iola Site and will be discussed briefly in the following sections.

3.0 Physical Setting

The 1965 (Photorevised 1984) United States Geological Survey (USGS) 7.5 Minute Topographic Map of the Iola, Kansas, Quadrangle (Photo revised 1984) indicates the Group B Smelters –UZ1 site is located on a generally flat area that slopes slightly to the southeast toward Rock Creek, a tributary of Elm Creek (Figure 1). The elevation of the ground surface of the property is approximately 960 feet above mean sea level. Surface drainage from the site is directed to a drainage ditch located north of the site that then drains into a ditch that flows to the southeast towards Rock Creek and eventually drain into the Neosho River from these entry points. The site is located approximately 2.5 miles from the Neosho River. There are no surface water bodies including ponds or lakes located onsite. According to the EDR report, the site is not listed within a flood plain.

According to a preliminary investigation report produced by KDHE at the East Iola Site in February 1994, Allen County is underlain by sedimentary rocks from the Paleozoic and Cenozoic Eras. These rocks are largely comprised largely of interbedded limestone and shale units with rare interformational sandstones. These units are relatively impermeable in the subsurface, however generally weather at or near the surface. The surface weathering can greatly increase the water bearing capacity. Shallow weathered rocks of this age form important low-yielding aquifers throughout Allen County. An unconfined groundwater system is present in the shallow bedrock as indicated by flooded limestone quarries in the site vicinity.

According to the same report, the area is estimated to be underlain by five to twenty feet of unconsolidated material composed of silty clay and fine-grained colluvium and residuum. The unconsolidated materials in the vicinity of the Site do not yield appreciable amounts of potable groundwater. A seasonal perched water zone is present during wet periods of the year. According to information obtained from the Kansas Geological Survey water well database for Allen County, the depth to groundwater in area wells ranges from approximately 25 to 40 feet below ground surface. A drainage way, which was dry at the time of this assessment, is located immediately north of the Site. Another drainage way, which was also dry at the time of this assessment, was located near the south central portion of the property. According to topographic maps and visual observation, the anticipated groundwater flow is directed to the south-southeast towards Rock Creek.

4.0 Historical Records

Sanborn maps, aerial photographs, historical documents, including newspaper articles and others, and interviews with persons familiar were utilized in an effort to delineate the location of smelter operations in the location of the UZ1 Site. Newspaper articles chronicled in the City of Iola library were also reviewed to determine any operational histories of the smelter sites or any adjacent operations. The only aerial photograph available in the city of Iola and in Allen County was from 1986 (Figure 7). A 1992 aerial photograph was also obtained from the Microsoft Terraserver website (Figure 8).

4.1 Allen County Plat Maps

A 1906 Allen County Plat Map for the city of Iola, Kansas was obtained from the Allen County Historical Society in Iola, Kansas (Figure 6). This plat map presented property boundaries, owner names, large businesses and structures, and any underground utilities. The UZ1 Site is pictured east of the town and is occupied by the United Zinc and Chemical Company lead and zinc smelter. There appears to be several buildings pictured associated with lead smelting operations and several railroad spurs connecting the Site to the main railroad line. Prime Western Smelting Company is also pictured to the east of this property with several buildings pictured. Several buildings are also pictured to the west of the UZ1 Site on the Coberly Site pictured as the United Iron Works Company. A 1906 Allen County Plat map encompassing the cities of Iola, Gas, and LaHarpe was also obtained from the Allen County Historical Society (Figure 4). This plat map presented property boundary lines as well as property owners. This plat map does not indicate who the owner of the property is and does not mention the United Zinc and Chemical Company, however a few structures are identified. Prime Western Smelting Company is pictured to the east with associated buildings. The United Iron Works Company is also pictured but does not indicate an owner name.

A 1921 Allen County Plat Map for the cities of Gas, Iola, and LaHarpe was also obtained from the city of Iola Public Library (Figure 5). This plat map indicated ownership by the United Zinc and Chemical Company but did not indicate any buildings or structures on site. J.B. Kirk Gas Company is identified to the east and United Iron Works Company is identified to the west. Historical plat maps from additional years were not available in the city of Iola or in Allen County. Current plat maps were not available in the city of Iola or Allen County. Parcel boundaries are indicated on the 1986 aerial photograph and a list of property owners for each parcel is included as an additional table (Appendix B).

4.2 Ownership Records

As indicated on the 1906 Allen County Plat Map, the 1921 Plat Map, Register of Deeds records, and other historical records, the property was owned by the United Zinc and Chemical Company from approximately 1902 to 1925. William Lanyon, co-owner of Lanyon Zinc Company, also owned the property from 1901 to 1902. A detailed chain-of title search was performed by Street Abstract Company, Inc. in Iola, Kansas and is described below in the following section. A table detailing the chain of title information for the Site is also attached as Table 1, Appendix B.

4.3 Chain of Title Records

Street Abstract Company, Inc., located in Iola, Kansas prepared a detailed and complete chain of title search for the parcels comprising the UZ1 Site (Table 2, Appendix C). There are ten individual parcels that comprise the UZ1 site. Each property was researched and a certificate of title was prepared. According to the records, the United Zinc and Chemical Company owned the land as early as 1902 and continued to occupy the land until 1925, when it was transferred to private ownership. William Lanyon, a co-owner of the Lanyon Zinc Company, owned the land from 1901 till 1902. It is unclear whether or not he operated a lead smelter on this property during that period of time. William Lanyon transferred the parcels of property to the United

Zinc and Chemical Company in 1902. United Zinc and Chemical Company owned and operated a lead smelter until 1912. It is unknown as to how the land was utilized after this period and until the end of its ownership.

4.4 City Directories

City directories include listings of residences, businesses and professional concerns organized alphabetically by name and alphanumerically by street name then specifically by street address. City directories used in this study were made available through the Iola Public Library.

A review of the various City of Iola, including Gas and LaHarpe City Directories from 1901 to 1936 (approximate years of smelter operation in these cities) was conducted to evaluate land usage for the site pertaining to any lead smelting activities. The only available city directories were from the years 1901-1902, 1908, 1921-1922, 1923-1924, 1928, and 1936. Due to the location of each historical smelter, mainly on the outside of the city limits, city directory listings did not give the address listings but instead gave directions from city limits. No addresses were given for each facility. The listings and associated locations for the United Zinc and Chemical Company were as follows:

- 1901
  George E. Nicholson Spelter – east bey limits (location of East Iola Site)
  United Zinc and Chemical Company – not listed
  United Iron Works Company – not listed

- 1908
  United Zinc and Chemical Company – ¼ e of city limits, city directory did not give an address for this site, only an approximate location
  United Iron Works Company – ne corner of Kentucky (location of Coberly Site)
  Prime Western Spelter Company Works #3 – ¼ e of city limits (location of East Iola Site)

- 1921-1924
  United Zinc and Chemical Company – not listed
  United Iron Works – no address listed (location of Coberly Site)
  JB Kirk Gas and Smelting Company – 4-8 Northrup Bldg (location of East Iola Site)

- 1936
  JB Kirk Gas and Smelting Company – 4-8 Northrup Bldg (location of East Iola Site)

4.5 Sanborn Fire Insurance Maps

In the late nineteenth century, the Sanborn Company began preparing maps for use by fire insurance companies. These maps indicate construction materials for specific structures and the presence of flammable materials. These maps were updated and expanded geographically at various periods during the twentieth century. Sanborn Maps are typically published for central business districts and were not discovered for the subject site. Maxim performed research for Sanborn Maps at the Allen County Historical Society, Kansas Historical Society, Iola Public

Library, and Kansas City, Kansas Public Library. The United Zinc and Chemical Company is identified on Sanborn Maps from the years 1901, 1905, and 1912 and is described below. Sanborn Maps from each year are included as Appendix A.

- 1901
  It appears that the site was originally occupied by the Standard Acid Company. No other historical resources reviewed indicated the presence or existence of this company on the Site. There appears to be a furnace building housing three furnaces and 12 retorts, located on the most western side of the property. A pottery and clay building is pictured to the east of the furnace building. A railroad line or spur dissects the property in the center and separates the furnace and pottery buildings from the rest of the facility. A chamber building, tower building, and machinery kiln are located to the east of the railroad line and extends over the entire property north and south. A nitrate acid building is also pictured on the east side, west of the chamber building. Several small structures including an office, store rooms, and miscellaneous buildings are located throughout the property.

- 1905
  The property is occupied by the United Zinc and Chemical Company. The Standard Acid Company buildings appear to be utilized with some additional structures. There appears to be two furnace buildings housing four furnaces. The pottery room is still utilized as such with additional small buildings surrounding which appear to be utilized as ore crushing houses and kilns. A second pottery building is located to the north of this structure. A sulfuric acid storage building is located in the center of the railroad spur dissecting the property. Several store rooms and ore houses are pictured directly east of the railroad. The chamber building is pictured on the east side of the property and appears to contain acid chambers. The tower building and machinery kiln buildings are pictured with several additional small buildings utilized as ore houses. An additional building located south of the machinery kiln appears to have been utilized as an ore house and crushing house. Several other miscellaneous storage buildings and an office are located throughout the property.

- 1912
  The United Zinc and Chemical Company no longer occupies the property. What appears to have been the former pottery rooms and associated buildings are the only structures shown on the Sanborn Map. The railroad system and spurs are pictured to the east of the buildings. The property and buildings are marked as "Formerly United Zinc and Chemical Co.". The office also still remains on the south side of the property.

4.6 Aerial Photography

The 1986 aerial photograph (Figure 7) shows the property usage as follows:

- The south portion of the site is occupied by several commercial structures. The southeast corner is occupied by two companies including a grain and fertilizer distributor and a chemical distributor, with associated buildings and supplies. The central portion is

occupied by a commercial structure and a couple of associated structures. The west side is occupied by a flea market and associated storage sheds and buildings. Monroe Street separates the south side from the north side of the property.

- The northern half of the property appears also to be occupied by commercial structures and some vacant land. The northeast corner is occupied by a flea market and associated buildings. The center of the property is occupied by an open field that appears to be used as pastureland with a few abandoned buildings used as hay and equipment storage. An unknown shed is located on the southwest corner. The furthest west portion of this property is an extension of a small concrete plant on the west adjacent property.

Property boundaries and land utilization as pictured on the 1986 aerial photograph are also pictured on the 1992 aerial photograph (Figure 8).

5.0 Regional History

The discovery of numerous gas fields in and around Iola spurred the expansion of the zinc and lead smelting business to expand from Pittsburg, Kansas where it was started in the Midwest and utilized coal as a fuel source, to Iola, Gas, and LaHarpe, Kansas. Natural gas as a fuel for smelting operations was not introduced to the Iola area until approximately 1899 to 1900. Cherokee Zinc Company, Prime Western Smelting Company, Lanyon Zinc Company, A. B. Cockerill Zinc Smelter, George E. Nicholson Zinc Smelter, J.B. Kirk Gas and Smelting Company, and United Zinc and Chemical Company all constructed plants in and around Iola, Kansas by the early 1900s and through the 1930s. Often the individual smelters were bought and sold by different operators. Smelting operations ceased or slowed in this area after the stores and supply of natural gas became less abundant and less cost effective. The first smelter was constructed and started in approximately 1896 and the last known existence of operations in this tri city area was around 1924. Actual records of the smelter operations and waste handling practices were not available at the time of this assessment. Any available information regarding plant buildings and foundations was taken from Sanborn Maps, ownership records, register of deeds records, city directories, historical plat maps, historical articles, and interviews with those persons familiar with the site.

5.1 United Zinc #1 Site Operational History

According to plat maps from 1901 this property was the location of the Standard Acid Company. It is unknown what operations were conducted at this company. Other historical resources including chain of title, city directories, plat maps, and register of deeds information did not indicate any presence of this company on this site. According to the 1901 Sanborn Map, the Standard Acid Company consisted of three furnaces (in one building) with 12 retorts. A pottery room with associate kilns is also pictured. A chamber building, possibly housing acid chambers, and a machinery kiln are also pictured. A railroad spur dissects the property in the center.

According to plat maps from 1906, the United Zinc and Chemical Company owned and operated a plant in the location of the UZ1 site, located north of Hwy 54 and east of Kentucky Street. Historical Sanborn index records indicate that the company occupied and operated at this site as

early at 1906 and as late as 1912. However, the property was owned by the company as late as 1925. It appeared that United Zinc and Chemical Company operated approximately four furnaces with approximately eight kilns, 14 retorts, and used several buildings located to the east for crushing and roasting processes. An acid chamber building is pictured with six chambers and a machinery kiln building. A railroad spur is indicated on the center of the property separating the furnaces from the acid towers. Actual records of the smelter operations and waste handling practices were not available at the time of this assessment. According to chain of title records, William Lanyon, a co-owner of the Lanyon Zinc Company, owned this parcel of land from 1901 till 1902. It is unclear whether or not he operated a lead smelter on this property during that period of time. William Lanyon transferred the parcels of property to the United Zinc and Chemical Company in 1902. Smelting operations by additional companies, including Lanyon Zinc Company, were not identified on this property during the time of this assessment.

5.2 East Iola Site Property Operational History

According to historical records including, plat maps, register of deeds records, newspaper articles, and Sanborn Maps and a preliminary assessment report by KDHE, in1899 George E. Nicholson built and operated a zinc smelter plant in the location of the East Iola site, located north of Hwy 54 and west of Hwy 169. According to Sanborn Maps, this plant appeared to have two furnaces with 20 retorts, five kilns, and two associated buildings south of the furnaces that included pottery and roasting buildings. Several railroad spurs connected the buildings with the furnaces. A later Sanborn Map depicts the Nicholson smelter similar to the later illustration of the Prime Western smelting operations. Around 1902, the smelter was purchased from Prime Western Smelting Company and the Works #3 plant was constructed. According to Sanborn Maps this plant appeared to operate five furnaces with 20 retorts, ten kilns, and also included several buildings used in the roasting and crushing process. These buildings were located south of the furnaces and were connected by railroad spurs to and from the furnaces. This plant construction did not appear very different from the previous operation. The Prime Western Spelting Company owned and operated the smelter until approximately the early 1920's when the smelter was then bought by J. B. Kirk Gas and Smelting Company. J.B. Kirk owned and operated a smelter in this location until approximately 1925. According to Sanborn Maps, this plant appeared to have three furnaces with ten retorts, four kilns, and a pottery and ore crushing and storage building. Several other associated buildings are pictured throughout the property. Since the smelting operations ceased, the East Iola Site has been developed and operated by several commercial or retail businesses. These businesses do not apparently have an association with former smelter operations.

5.3 Coberly Site Property Operational History

According to Sanborn Maps available and a preliminary assessment report by KDHE, the Iola Brick Company #1 plant operated at the Site as early at 1901 and discontinued as late as 1906. Four natural gas fueled kilns were located south of a dry shed. In 1906, United Iron Works, Inc., operated a steel foundry and iron works facility. The dry shed appeared to have been converted into a machine shop and the four kilns were removed. According to a 1912 Sanborn Map, the plant consisted of a foundry building, a boiler shop, a machine shop, and associated storage areas and offices. According to the 1924 Sanborn Map, additional buildings consisting of storage

areas and bath houses were constructed and the boiler shop was expanded. According to city directories and other historical resources, the United Iron Works operated at the location as late as 1924. The Site was not used for commercial purposes until approximately 1986 when M&D Enterprises, Inc., a gasket manufacturing company, operated at the site. In 1990, The Coberly Recycling Company, operated a collecting center for recyclable materials, including aluminum cans. In 1990 the Empire Bank of Iola took over the property. Michael Truck Repair is currently operating at the site.

6.0 Interviews

Michael Anderson, Allen County Historical Society, Iola, Kansas
Mr. Anderson was interviewed on June 20 and July 16, 2003. A map of the area was presented to him. He was aware of a zinc smelter in that area but was unclear on the exact location of smelter operations and the name of that operation.

Dave Sherrill, former owner of the north adjacent property, Iola, Kansas
On July 15, 2003, Mr. Sherrill was interviewed by Maxim personnel. Mr. Sherrill stated that he had just sold the land to a separate party but did mention the former uses of the property in question. He stated that the north adjacent property had been used as a processing plant and that he had worked there from 1955 to 1988 when the property was sold. He also stated that he had been told at one time the property had been occupied by a glass factory and to his knowledge had not been part of the property used for smelting operations. He was aware of the property just south of his property being used for smelting operations but did not know the specifics.

Lawrence Macha, owner of a portion of the East Iola Site
Interview and discussion detailed in Section 8.0, Previous Investigations and Corrective Action

Dawn M. Mueller, owner of a portion of the UZ1 Site
On July 14, 2003, Ms. Dawn Mueller was interviewed by Maxim personnel. Ms. Mueller stated that she did not know of any former smelter companies that had operated on the property. She did not know of any waste that had been identified on the property.

7.0 Environmental Records (EDR) Search

A review of databases and files from federal, state, and local environmental regulatory agencies was conducted to identify use, generation, storage, treatment, or disposal of hazardous materials and chemicals, or release incidents of such materials, which may impact the site. Environmental Database Resources, Inc. (EDR) provided the federal and state environmental database information. EDR minimum search distances for each database are consistent with those presented in ASTM standard E1527. A complete copy of the regulatory review is included in Appendix E. A specific description of each database researched is also provided in the EDR summary. A summary of federal and state databases researched is included in the following table.

Federal ASTM Standard Records Researched

Record	ASTM radius search (miles)	Actual radius search
National Priority List (NPL)	1.0	1.5
Comprehensive Environmental Response, Compensation, and Liability Information System (CERCLIS)	0.5	1.0
CERCLIS-NFRAP (No Further Remedial Action Proposed)	Property and adjoining properties	0.75
Corrective Action Report (CORRACTS)	1.0	1.5
Resource Conservation and Recovery Information System (RCRIS) (TSD)	0.5	1.0
RCRIS – Large Quantity Generator	0.5	0.75
RCRIS – Small Quantity Generator	0.5	0.75
Emergency Response Notification System (ERNS)	Site property	0.5
Delisted NPL	---	1.0
Mines Master Index File (MINES)	---	1.0
Superfund Consent Decrees (CONSENT)	---	1.0
Records of Decision (ROD)	---	1.0

--- ASTM does not list a standard search distance

State ASTM Standard Records Searched

Record	ASTM Search Radius	Actual Search Radius
State Hazardous Waste (SHWS)	1.0	1.5
Directory of Sanitary Landfills, Solid Waste Transfer Stations and Collectors in Kansas (SWF/LF)	0.5	1.0
Leaking Underground Storage Tanks (LUST)	0.5	1.0
Underground Storage Tanks (UST)	Site and adjoining properties	0.75
Underground Storage Tanks on Indian Land (INDIAN)	Site and adjoining properties	0.75
Aboveground Storage Tanks (AST)	0.5	1.0
Leaking Aboveground Storage Tanks (LAST)	0.5	1.0
Kansas Spills Database (SPILLS)	---	1.0
Areas of Concern (AOCONCERN)	---	1.0

--- ASTM does not list a standard search distance

Other Databases Searched

Record	ASTM Search Radius	Actual Search Radius
Oil/Gas Pipelines/Electrical Transmission Lines	---	1.0
Sensitive Receptors	---	1.0
Flood Zone Data	---	1.0
National Wetlands Inventory (NWI)	---	1.0

--- ASTM does not list a standard search distance

A summary of EDR report results is as follows:

Adjacent Sites

- Jump Start Travel Center, located approximately 800 feet to the east of the Site, was reported on the Underground Storage Tank (UST) database. Four USTs, three gasoline and one diesel, are currently in use at the facility.

- Coberly Recycling (location of Mike's Truck Repair), formerly located at 1304 East Street and approximately 1000 feet west of the Site, was listed on the federal CERCLIS and SHWS databases. Site status is listed as "No Further Remedial Action Planned". The SHWS database lists the existence of smelter waste piles on this site with possible soil contamination and the potential for groundwater contamination. According to a KDHE Identified Sites List, 20 cubic yards of contaminated soil was removed from the site in 1990, encapsulated in cement, and taken to the Allen County Landfill with KDHE approval. A responsible party has not been identified since the soil removal in 1990. This site is still listed as an active site on the KDHE Orphan Sites database.

- The East Iola Site was listed as a State Hazardous Waste Site (SHWS) as part of the Voluntary Cleanup Program (VCP). According to a KDHE Identified Sites List, areas of high lead concentration have been excavated and consolidated in one corner of the property. A plan to cap the contaminated soils is currently being implemented.

Within Search Distance

- Storrer Implement, located at 1801 East Street and approximately 800 feet to the east of the Site, was reported on the RCRIS, Small Quantity Generator (SQG) database. One violation is reported with a compliance date listed.

- Hiser Implement (location of Lucky Stop Gasoline Service Station), located at 1810 East Street and approximately 800 feet east of the Site, is reported on the RCRIS, SHWS, LUST, and UST database. Three violations with subsequent dates of compliance are listed on the RCRIS database. Metals were indicated in the soil and this site is part of an ongoing investigation as part of the VCP. A "Closed" status has been reported on the LUST database. The Lucky Stop L. L. C is listed on the UST database with three USTs, two gasoline and one diesel, currently in use. According to a KDHE Identified Sites List, this site is part of the VCP Program. A concrete and asphalt cap has been installed on the property to address the contamination and this property is in the final stages of completing the cleanup.

- L&S Motors (location of Sigg Motors), located at 1305 East Street and approximately 1000 feet west-southwest of the Site, is listed on the UST database. Three tanks containing gasoline are currently listed as permanently out of use.

- A former gasoline station referred to as U-DO Self Service and Vista Stores #2023, located approximately 1000 feet west of the Site and at former address 1201 East Street, was listed on the LUST and UST databases. U-DO Self Service was listed on the LUST database with a "Closed" status. Vista Stores was listed on the UST database with three USTs listed as "Temporarily Out of Use".

- Convenient Mart, located at 1107 East Street and approximately ¼ to ½ mile west of the Site, is listed on the LUST and UST databases. The LUST database listed the site as an "Active" site indicating that contamination levels exist exceeding state cleanup guidelines. The UST database lists three USTs as "permanently out of use".

- Allen County Hospital, located approximately 1 mile west of the Site, is listed on the LUST, UST and RCRIS databases. The UST database listed one 2000-gallon UST as "permanently out of use" and 2000-gallon UST as "current in use". The LUST database listed this site with a "Closed" status. The RCRIS database listed the site with no violations reported.

- Casey's General Store and Casey's General Store #1794, located approximately one mile west of the Site, was listed on the LUST and UST databases. According to the LUST database, the site is listed with a "Closed" status. The UST database lists two 10,000-gallon USTs "current in use".

- Johnson Property and Southwestern Bell, both located within one mile from the Site, were listed on the LUST database. Each site is listed with a status of "Closed".

A list of Orphan Sites was also summarized on the EDR Report. EDR defines Orphan sites as those that have unmappable addresses or locations (i.e. no address, bad zip code, etc.) or do not have a latitude or longitude assigned to it. The sites with corresponding databases are as listed.

Site Name	Site Address	Location to Site	Database
East Iola Smelter Site	East and Kentucky Streets	Adjacent	CERC-NFRAP
Iola Concrete Products, Inc.	---	Adjacent	UST
Carmel Energy, Inc.	3 MN 1 MW on Hwy 169	Within 1 mile	RCRIS-SQG, FINDS
Sohigro Svc Co	E Hwy 54	Within 1 mile	RCRIS-SQG, FINDS
Coberly Recycling	E Hwy 54	Adjacent	UST (Closed)
Sinclair Pipe Line Co.	S Hwy 169	Within 1 mile	UST
Mike's Body Shop	2.5 MS on Hwy 169	Adjacent	RCRIS-SQG, FINDS
Emprise Bank/Coberly Recycling	E US Hwy 54	Adjacent	LUST

Those orphan sites listed on the EDR report outside of a one mile radius were omitted from this table.

According to the KDHE, Storage Tank Section, Iola Concrete Products is a non-active site. A 500 gallon UST was installed in 1970. According to records the UST is listed as "temporary out of service". Emprise Bank/Coberly Recycling is also listed on the LUST database and according to the KDHE one tank of an unknown quantity has been removed. During a cleanup of this site a 500 gallon UST was discovered and removed. A follow up site assessment was conducted and a report turned in. Emprise Bank (owner) then was taken out of the KDHE Storage Tank Trust Fund and according to the Storage Tank Section, this site is no longer active with regards to USTs.

8.0 Previous Investigations and Corrective Action

No previous investigations have been conducted for the UZ1 property; however, the East Iola, Hiser Implement, and Coberly Sites have been subject to previous KDHE investigations. A preliminary investigation was conducted on the East Iola Site in February 1994. During the site reconnaissance, the site appeared to have been leveled and graded. The surface soil appeared to have been mixed with smelter wastes consisting of slag, broken clay tiles from retorts, and some finer grained smelter wastes. This present waste area appeared to cover approximately two acres. The depth of these waste piles at this site was unknown. The area was not fenced and could be accessed by the general public.

During this investigation several surface soil samples were collected. Surface soil analytical results indicate that total lead concentrations exceeded the KDHE residential risk value of 400 mg/kg in a large percentage of the samples. Each of these samples was taken from an area that appeared to be a waste/slag soil pile. A surface soil sample collected from an offsite area to the northeast indicated some lead impact also exceeding the 400 mg/kg residential risk value for lead.

East Iola Site

A second site investigation of the East Iola Site was conducted in June 1998. Several soil samples were collected and XRF results were collected. According to the XRF results, surface soil at several locations is impacted with high concentrations of lead, exceeding the residential risk value. This site is being addressed under the KDHE Voluntary Cleanup and Property Redevelopment Program. According to a KDHE Identified Sites List, areas of high lead concentrations have been excavated and consolidated in one corner of the property. A plan to cap the contaminated soil is currently being implemented.

An interview from Lawrence Macha concluded the following:

Lawrence Macha, owner of a portion of the East Iola Site property, Iola, Kansas

In April 2003, Mr. Macha was interviewed by Maxim personnel. Mr. Macha was hesitant to give access to the site because of the previous work that had been done on his site by the KDHE. Mr. Macha had been told by KDHE in 1994 about the levels of contamination that had been found on his property and that if he was to sell or develop his property he was to notify the KDHE. Mr. Macha stated that the property immediately adjacent to his, now occupied by the Lucky Stop gasoline station has been developed, to his knowledge had not notified the KDHE and was not taking the necessary precautions to minimize lead contamination migration to adjacent properties.

The Hiser Implement

The Hiser Implement property, located adjacent to the East Iola Site, is also currently being addressed under the VCP program. According to a KDHE Identified Sites List, a concrete and asphalt cap has been installed and the property is in the final stages of completing the cleanup.

Coberly Site

A few site investigations were also conducted on the Coberly Site, located adjacent to the UZ1 site to the west. An underground storage tank (UST) was removed from the former Coberly Recycling facility in February 1992. A soil sample collected from the excavated soil indicated lead concentrations at 47,000 milligram per killigram (mg/kg) of total lead, exceeding the KDHE residential risk values of 400 mg/kg. The soil was stabilized and taken to an approved landfill for disposal. During 1998, Kingston Environmental conducted an additional site investigation. Former slag piles were indicated on a north section of the property. Several soil samples were collected onsite and in the area of these former slag piles using an XRF. Total lead concentrations exceeded 400 mg/kg in a large percentage of the surface soil samples. Slag material located on the eastern property boundary of UZ1 site contained lead at 27,167 mg/kg. According to a KDHE Identified Sites List, 20 cubic yards of contaminated soil was removed from the site in 1990, encapsulated in cement, and taken to the Allen County Landfill with KDHE approval. A responsible party has not been identified since the soil removal in 1990.

9.0 Site Reconnaissance

An attempt to contact current owners by telephone was conducted before the site visit of UZ1. Six of the owners were unavailable at the time of this site reconnaissance. The owner of the grain/fertilizer distributor, located on the east side, refused access for a visual survey. Permission to perform a visual survey was obtained from one private owner for the center of the property. Maxim personnel conducted a site visit on June 30, 2003. Photographs documenting the site conditions during the reconnaissance are presented in Appendix F. A map detailing the Site property is included as Figure 3.

A vacant portion of the former smelter property located near the center was visually observed. All building foundations had been removed after smelter operations ceased in the 1920's. Distinctive waste piles, slag piles, buildings, etc. from former smelter operations were not visible. A portion of the site in the southwest corner did contain what appeared to have been a waste pile but had been graded and leveled. This portion of the site had been occupied historically by a business with a gravel lot used for parking. The gravel lot is the only feature left. Additional waste was observed mixed in with the soil and spread throughout the site. It appeared that some of the waste was also mixed in with roadbed material as part of the adjacent roads, Monroe Street and Kansas Drive. The smelter waste appears to be concentrated in the southwest corner, where cinders are at the surface and vegetation is distressed. The remaining portions of the vacant site were heavily vegetated with no visible areas of stress. No additional indications of impact including staining, stressed vegetation, or waste non-smelter related were observed during this site reconnaissance.

A newspaper article in December 1907 documented that the city had been using cinders as a road base but had discontinued use due to the acid in the cinders corroding the gas and water pipes. A newspaper article from March 1916 also documented that the smelters were beginning to sell their waste and cinders to railroad companies that were using them as roadbed materials for their railroads.

A small concrete foundation was observed on the northwest portion of this parcel but did not appear to have been part of the former operations. A small building is visible in this location on the 1986 aerial photograph. A small drainage area was located west of this piece of property between the flea market to the west and the property. The perimeter of the site was not fenced and access from the general public was unlimited.

The topography of the immediate site location and surrounding properties is relatively flat with a gentle slope to the south and southeast. A drainage way was observed near the center of the property extending from the south border to the center of the property near Monroe Street. At the time of the site reconnaissance the drainage way was dry. Immediately north of the property, a creek or drainage way was also observed. This also appeared to be dry or contained random areas of water.

A small pond or area of ponded water was observed on the adjacent property, north of the MFA distributor. However, during the site reconnaissance it appeared to be dry. A large above ground storage tank was located on the bank of this ponded area of water. The primary use of this aboveground storage tank is unknown. Several portable tanks of fertilizer and bags of fertilizer were also observed on the MFA distributor property during the site reconnaissance.

The property occupied by a flea market on the west side was observed from public vantage points. There appeared to be no visual evidence of lead smelter waste. However, in the rear of the property there appeared to be waste mixed in with the parking lot material and the road bed material. The front of the property was occupied by an asphalt parking lot and a large retail building.

The property owner of the area occupied by the grain and fertilizer distributor denied Maxim access. It appeared, from public vantage points, that this area did not contain smelter waste and was covered with grass and some concrete debris. The owner of the adjacent property to the east could not be reached after several attempts to gain access. As observed from public vantage points, it also appeared to not contain smelter waste and was covered with gravel and grass. These areas were also not fenced and were generally accessible to the general public.

The center portion of this area was being utilized as a pastureland with a couple of abandoned buildings used as hay and equipment storage. During this site investigation, the area was being used at patureland and was occupied by cattle. This area was not walked due to the cattle in the area. The east portion of this property is currently utilized as a flea market with several associated storage buildings and discarded items. The owners of the properties north of Monroe Street (Super Flea Flea Market) could not be contacted during this site assessment and did not respond to request to enter property. The northeast portion of the Super Flea site is vacant and is bounded by Monroe Street to the east. An inactive railroad bed was observed north of the Site that extended from the adjacent properties to the east and continued to the west.

10.0 Receptor Survey

A receptor survey was conducted to identify potential receptors of any identified contamination. The following potential receptors were investigated during the site reconnaissance. The findings

of the survey are listed below. Potential receptors were verified during the site reconnaissance and by using the EDR report Detail Map and page GR-7. Figure 2 illustrates surrounding land use and receptor survey findings.

Onsite

- No residential areas were indicated on the site property
- No residential or possible receptors were identified on the site property
- Surface Water - A drainage area was located on the site property near the center starting at the south boundary and extending north to Monroe Street near the center of the property. At the time of the assessment the drainage way was dry. No ponds, lakes, or rivers were identified on the site property.
- Water Wells – No domestic or public water wells were indicated on the site property.
- Sensitive Environments – EDR provided a NEPA Check for federal and state information on sensitive environments. According to EDR, no aquatic or wetland ecosystems, critical habitats, officially designated wilderness areas, wildlife preserves, or threatened or endangered species were identified on the site property. The site and the surrounding areas were not listed within a flood plain.

Adjacent Property

- Residential areas were indicated on adjoining properties within a ½ mile radius. Predominantly residential areas were observed to the north, northeast, northwest, west, and southwest of the site and include approximately 80 homes. Five of these homes are located immediately adjacent to the site on its north boundary. Information for the five homes is as follows:

  305 Kansas Drive
  Owner: First Title Service, Edmond, Oklahoma
  No children identified

  304 Kansas Drive
  Owner: Donald and Susan Dieboldt
  No children identified

  307 North Vermont Street
  Owner and resident: Danny Dee – Renee Sams
  Children: 2 boys

  303 N. Tennessee Street
  Owner and resident: Robert W. and Janet C. Wilson
  No children identified

304 N. Vermont
Owner and resident: Norma Yancey
Children: No

- No schools, churches, day cares, nursing homes, parks or public recreation areas, or pedestrian routes were identified on adjoining properties

- Surface Water Bodies – A drainage way was located directly north of the site property. During the time of the site reconnaissance, it appeared to contain very minimal water. A small pond was located directly east of the property. During the site reconnaissance the pond appeared to be dry. No ponds, lakes, or rivers were identified adjacent to the site property.

- Water Wells – According to the KGS Water Well Database, one monitoring well, located on the southwest adjoining property, was identified. No public water supply wells or domestic water wells were indicated adjacent to the site during the site reconnaissance.

- Sensitive Environments – EDR provided a NEPA Check for federal and state information on sensitive environments. According to EDR, no aquatic or wetland ecosystems or critical habitats were observed adjacent to the site. No officially designated wilderness areas, wildlife preserves, or threatened or endangered species were indicated adjacent to the site. The site and the surrounding areas were not listed within a flood plain.

Within ½ Mile

- Residential areas were indicated on adjoining properties within a ½ mile radius. Predominantly residential areas were observed to the north, northeast, northwest, west, and southwest of the site and include approximately 80 homes. Five of these homes are located immediately adjacent to the site on its north boundary.

- The following potential residential receptors were also observed during the site reconnaissance within a ½ mile radius of the site:
  Schools – 4
  Churches – 5
  Day Cares – 2
  Nursing Homes – 0
  Parks or Public Recreation Areas – 0
  Pedestrian Routes – sidewalks and road right of ways located on south adjacent property

- Surface Water Bodies within a ½ mile radius were observed and they are as follows:

  Ponds – An agricultural pond was observed approximately 1,800 feet southeast of the site. No inlets or outlets were observable.

  Lakes – No lakes were observed within a ½ mile radius

Intermittent Creeks and Tributaries and Rivers and River Basins – Rock Creek flows northeast/southwest into Elm Creek and is located approximately 2,200 feet southeast of the site. Elm Creek, a major tributary to the Neosho River is located approximately 4,200 feet southwest of the site. The Neosho River is located approximately 2.3 miles southwest of the site. As indicated on the topographic map, an intermittent tributary is also located approximately 1,000 feet east of the site.

- Water Wells – Several water wells were indicated on the Kansas Geological Survey (KGS) Water Well Database within ½ mile of the site. A detailed list is included as Appendix D. The majority of the domestic wells identified have been plugged. One domestic well, located approximately one mile to the southwest, was indicated on the database. No public water supply wells or domestic water wells were indicated within a ½ mile of the site during the site reconnaissance from observations and reviewing EDR Records.

- Sensitive Environments – EDR provided a NEPA Check for federal and state information on sensitive environments. According to EDR, no aquatic or wetland ecosystems or critical habitats were observed within a ½ mile radius of the site. No officially designated wilderness areas, wildlife preserves, or threatened or endangered species were indicated within a one mile radius of the site. The site and the surrounding areas were not listed within a flood plain.

According to the City of Iola administration office, the City of Iola receives its water supply from the Neosho River, City of Iola Water Works Water Plant, west of the city and approximately two miles from the UZ1 site.

11.0 Recognized Environmental Conditions

Based on the Phase I FFSA research discussed herein, RECs are as follows:

1. The Coberly and East Iola Sites are located directly adjacent to the UZ1 property. Previous investigations identified lead impacts significantly above KDHE standards at both of these sites. Further, Phase I research and site reconnaissance findings indicate that smelter wastes may have been distributed throughout the UZ1 and adjacent properties as a result of both smelting and improvement activities. Although the East Iola and Coberly sites are being addressed under KDHE programs, no previous environmental assessment or corrective measures have occurred at the UZ1 property.

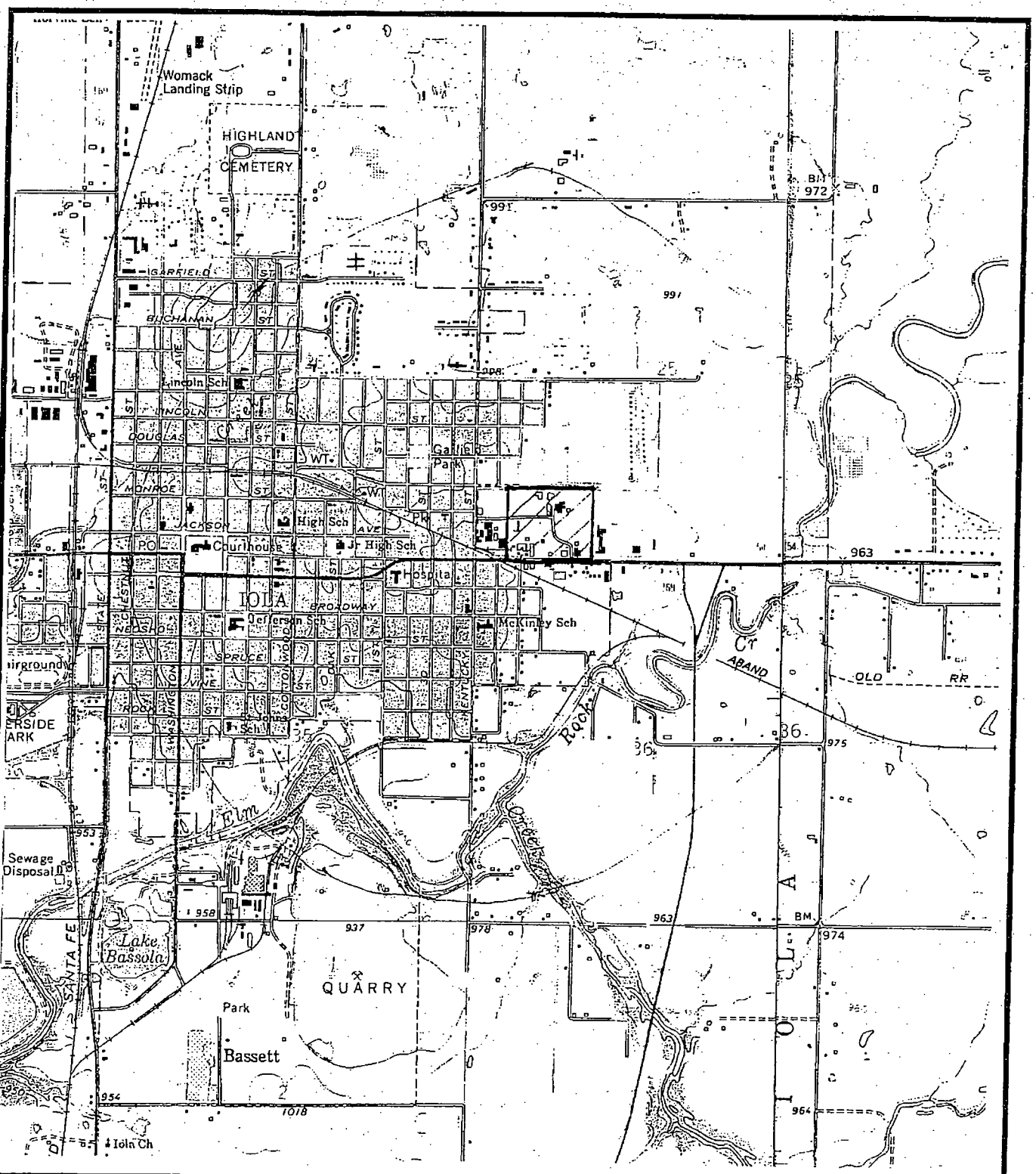
2. Phase I research indicates that the UZ1 property operated as a smelter facility for approximately six to seven years in the early 1900s. Lead impact is often associated with smelting facilities and apparent smelter waste piles were observed on the UZ1 property in areas located on the southwest corner and mixed with material and spread throughout the entire site.

3. A former gas station, Convenient Mart, located approximately 1000 feet west of the site is listed as "Active" and may still contain petroleum contamination levels above state cleanup levels.

12.0 Conclusions

Information obtained during the Phase I investigation indicates that smelting facilities were located at the UZ1 (operating from approximately 1906 to 1912) and adjacent East Iola properties. The Coberly Site also contained some smelter wastes from the UZ1 property. As a result of these operations, heavy metal-impacted waste and/or surface soil may be present on the property. Access to the site is not restricted to the general public, resulting in the potential for a complete exposure pathway to residents living or working in the site vicinity. Given the elevated concentrations of lead detected in surface soil samples collected from previous investigation on the property immediately adjacent to the UZ1 site and the potential for a completed human exposure pathway, a Phase II investigation designed to preliminary ascertain the potential exposure risk is warranted.

FIGURES



Maxim Technologies, Inc.
721 S. Packard
Kansas City, Kansas 66105

SITE LOCATION MAP

United Zinc #1 Smelter Site
East Iola, Kansas
Figure 1

Date: 1966, Photorevised 1984
Project No.: 3390184
Source: USGS 7.5 Minute Topographic Map, Iola, Kansas
Scale: 1 inch = 2,000 feet

N

TETRA TECH, INC.

April 7, 2006

Mr. Roy Crossland
START Project Officer
U.S. Environmental Protection Agency, Region 7
901 North 5th Street
Kansas City, Kansas 66101

Subject: **Quality Assurance Project Plan**
Integrated Site Assessment of the United Zinc #1 Site, Iola, Kansas
U.S. EPA Region 7 START, Contract No. EP-S7-06-01, Task Order No. 0011.000
Task Monitor: Eddie McGlasson, On-Scene Coordinator

Dear Mr. Crossland:

Tetra Tech EM Inc. is submitting the attached Quality Assurance Project Plan for an integrated removal site evaluation and preliminary assessment of the United Zinc #1 site. If you have any questions or comments, please contact the Tetra Tech START Project Manager, at (913) 908-4649.

Sincerely,

for

Rick Claytor, CHMM
START Project Manager

Ted Faile, PE, CHMM
START Program Manager

Enclosures

X9004/0011

8030 Flint Street, Lenexa, KS 66214
Tel 913.381.1600 Fax 913.894.6295

QUALITY ASSURANCE PROJECT PLAN
FOR AN INTEGRATED SITE ASSESSMENT OF THE
UNITED ZINC #1 SITE
IOLA, ALLEN COUNTY, KANSAS

Superfund Technical Assessment and Response Team (START) Contract
Contract No. EP-S7-06-01, Task Order 0011

Prepared For:

U.S. Environmental Protection Agency
Region 7
Superfund Division
901 N. 5th Street
Kansas City, Kansas 66101

April 7, 2006

Prepared By:
Tetra Tech EM Inc.
8030 Flint Street
Lenexa, Kansas 66214
913-894-2600

CONTENTS

Section/Table **Page**

QUALITY ASSURANCE PROJECT PLAN FORM 1

TABLE 1: SAMPLE SUMMARY 6

TABLE 2: DATA QUALITY OBJECTIVE SUMMARY 6

Appendices

A SITE-SPECIFIC INFORMATION FOR AN INTEGRATED SITE ASSESSMENT OF THE UNITED ZINC #1 SITE

B SITE AREA MAP

Region 7 Superfund Program
Quality Assurance Project Plan Form
for the United Zinc #1 Site

Project Information:

Site Name: United Zinc #1 Site		City: Iola	**State:** Kansas
EPA Project Manager: Eddie McGlasson		**START Project Manager:** Rick Claytor	
Approved By:		**Prepared For:** EPA Region 7 Superfund Division	
Title: for START Project Manager	**Date:** 4/7/06		
Approved By:			
Title: START Program Manager	**Date:** 4/7/06		
Approved By: Kathy Homes	4/7/06	**Prepared By:** Rick Claytor **Date:** April 3, 2006	
Title: START QA Manager	**Date:**		
Approved By:			
Title: EPA Project Manager	**Date:**		
Approved By:		**Tetra Tech START Project Number:** X9004.06.0011.000	
Title: EPA QA Coordinator	**Date:**		

1.0 Project Management:

1.1 Distribution List

EPA—Region 7: Eddie McGlasson, Project Manager
Diane Harris, QA Coordinator

Tetra Tech START: Rick Claytor, Project Manager

1.2 Project/Task Organization

Eddie McGlasson, of the EPA Region 7 Superfund Division, will serve as the EPA project manager for the activities described in this QAPP. Rick Claytor, of Seagull Environmental Technologies, Inc. (SETI), will serve as the START project manager for field activities.

1.3 Problem Definition/Background:

Description: This site-specific Quality Assurance Project Plan form is prepared as an addendum to the **Generic Quality Assurance Project Plan for Superfund Integrated Assessment Activities, November 1998,** and contains site-specific data quality objectives for the sampling activities described herein.

☒ Description attached.
☐ Description in referenced report: _____ _____
Title **Date**

1.4 Project/Task Description:

☒ CERCLA PA ☐ CERCLA SI ☐ Brownfields Assessment
☐ Other (description attached): ☐ Pre-CERCLIS Site Screening ☒ Removal Assessment

Other Description:

Schedule: Field work is scheduled to begin on April 11, 2006, and is anticipated to last about six weeks.

☐ Description in referenced report: _____

1.5 Quality Objectives and Criteria for Measurement Data:

a. Accuracy:	☐ Identified in attached table.
b. Precision:	☐ Identified in attached table.
c. Representativeness:	☐ Identified in attached table.
d. Completeness*:	☐ Identified in attached table.
e. Comparability:	☐ Identified in attached table.

Other Description:

*A completeness goal of 100 percent has been established for this project. However, if the completeness goal is not met, EPA may still be able to make site decisions based on any or all of the remaining validated data. Soil and groundwater samples collected from residential properties will be considered "critical samples" because the results are crucial to accurately assess the overall threat(s) posed by the site.

Region 7 Superfund Program
Quality Assurance Project Plan Form
for the United Zinc #1 Site

Project Information:

1.6 Special Training/Certification Requirements:

☒ OSHA 1910 ☒ Special Equipment/Instrument Operator (describe below): ☐ Other (describe below):
Along with the training listed above, familiarization with a Niton™ x-ray fluorescence spectrometer and its operating procedures will be necessary for the Tetra Tech START team.

1.7 Documentation and Records:

☒ Field Sheets ☒ Site Log ☒ Trip Report ☒ Site Maps ☐ Video
☒ Chain of Custody ☒ Health and Safety Plan ☒ Letter Report ☒ Photos

☒ Sample documentation will follow EPA Region 7 SOP 2420.05D.
☒ Other. Analytical information will be handled according to procedures identified in Table 2.

2.0 Measurement and Data Acquisition:

2.1 Sampling Process Design:

☐ Random Sampling ☐ Transect Sampling ☒ Biased/Judgmental Sampling ☐ Stratified Random Sampling
☐ Search Sampling ☐ Systematic Grid ☐ Systematic Random Sampling ☒ Definitive Sampling
☐ Screening w/o Definitive Confirmation ☒ Screening w/ Definitive Confirmation
☒ Sample Map Attached

☐ Other (Provide rationale behind each sample): See Attachment A for additional sampling information.

The proposed sampling scheme will be judgmental, in accordance with the *Guidance for Performing Site Inspections Under CERCLA*, OSWER Directive #9345.1-05, September 1992, and *Removal Program Representative Sampling Guidance, Volume 1: Soil*, OSWER Directive 9360.4-10, November 1991. Judgmental sampling is the subjective (biased) selection of sampling locations based on historical information, visual inspection, and the best professional judgment of the sampler(s). See Appendices A and B for additional site-specific information and site maps.

Soil screening and sampling for laboratory confirmation analysis will be conducted in accordance with *Superfund Lead-Contaminated Residential Sites Handbook*, OSWER 9285.7-50, August 2003. Groundwater samples will be collected for laboratory analysis from any drinking water wells located at properties where soil screening is conducted. Exact sample locations will be determined during reconnaissance activities performed in the field. The proposed number of samples is a balance between cost and coverage, and represents a reasonable attempt to meet the study objectives while staying within the budget constraints of a typical site investigation.

Sample Summary Location	Matrix	# of Samples*	Analysis
Residential yards, parks, school yards, daycare centers	Soil	180	arsenic, zinc, cadmium, lead
Private drinking water wells	Water	10	arsenic, zinc, cadmium, lead (total)

*NOTE: Background/QC samples are not included with these totals. See Table 1 for a complete sample summary. The estimate of 180 soil samples is based on an assessment of 300 properties, with six samples collected from each property, yielding 1,800 samples for field screening. Ten percent of the screened samples would yield 180 samples for laboratory confirmation analysis.

Region 7 Superfund Program
Quality Assurance Project Plan Form
for the United Zinc #1 Site

2.2 Sample Methods Requirements:

Matrix	Sampling Method	EPA SOP(s)
Soil	Surface soil samples will be collected with disposable stainless steel spoons and field-screened with a XRF. Approximately 10 percent of the samples will be submitted for laboratory confirmation analysis.	4231.1707, 4231.2012
Water – Private drinking water wells	Drinking water samples will be collected directly into sample containers from taps or spigots closest to the well head and submitted for laboratory analysis.	4230.10A

☐ Other Description:

2.3 Sample Handling and Custody Requirements:

☒ Samples will be packaged and preserved in accordance with procedures defined in Region 7 EPA SOP 2420.06D.
☒ COC will be maintained as directed by Region 7 EPA SOP 2420.04C.
☒ Samples will be accepted according to Region 7 EPA SOP 2420.01D.

☐ Other (Describe):

2.4 Analytical Methods Requirements: ☒ Identified in attached table.

☒ Rationale: The requested analyses have been selected based on historic information about the site and program experience with similar types of sites.

☐ Other (Describe):

2.5 Quality Control Requirements: ☐ Not Applicable ☒ Identified in attached table.

☒ Field QC Samples: For this investigation, field QC samples will include one water field blank prepared with DI water provided by EPA Region 7 laboratory. The field blank will be collected to evaluate contamination of sampling containers and/or preservatives, and to assess contamination potentially introduced during the sampling procedure(s). In addition, 18 field duplicate soil samples and one duplicate drinking water sample will be collected to evaluate total method precision. All QC samples will be submitted for the analyses listed in the attached tables. Evaluation of the blank sample will depend on the levels of contamination found in environmental samples to determine whether the environmental samples are representative. Analytical results of the blank sample will be evaluated qualitatively by the EPA project manager and EPA contractor(s) for a general indication of field-introduced and/or lab-introduced contamination. Relative percent differences among duplicate samples will be calculated to determine the total method precision for the sampled matrices.

☐ Other (Describe):

2.6 Instrument/Equipment Testing, Inspection, and Maintenance Requirements: ☐ Not Applicable

☒ Testing, inspection, and maintenance of analytical instrumentation will proceed in accordance with the previously referenced SOPs and/or manufacturers' recommendations.

☒ Other (Describe): Testing, inspection, and maintenance of field instruments (GPS units, Niton™ XRF, etc.) will proceed in accordance with manufacturers' recommendations.

2.7 Instrument Calibration and Frequency: ☐ Not Applicable

☒ Calibration of laboratory equipment will proceed as described in the previously referenced SOPs and/or manufacturers' recommendations.

☒ Other (Describe): Calibration of field instruments will follow the manufacturers' recommendations.

2.8 Inspection/Acceptance Requirements for Supplies and Consumables: ☐ Not Applicable

☒ All sample containers will meet EPA criteria for cleaning procedures for low-level chemical analysis. Sample containers will have Level II certifications provided by the manufacturer in accordance with pre-cleaning criteria established by EPA in *Specifications and Guidelines for Obtaining Contaminant-Free Containers.*

☐ Other (Describe):

2.9 Data Acquisition Requirements: ☐ Not Applicable

☒ Previous data or information pertaining to the site (including other analytical data, reports, photos, maps, etc., that are referenced in this QAPP) has been compiled by EPA and/or its contractor(s) from other sources. Some of that data have not been verified by EPA and/or its contractor(s); however, that unverified information will not be used for decision-making purposes by EPA without verification by an independent professional qualified to verify such data or information.

☐ Other (Describe):

2.10 Data Management:

☒ All laboratory data acquired will be managed in accordance with Region 7 EPA SOP 2410.01D.

☐ Other (Describe):

3.0 Assessment and Oversight:

3.1 Assessment and Response Actions

☒ Peer Review ☒ Management Review ☐ Field Audit ☐ Lab Audit

☒ Assessment and response actions pertaining to analytical phases of the project are addressed in Region 7 EPA SOPs 2430.05C and 2430.12E.

☐ Other (Describe):

3.1A Corrective Action:

☒ Corrective actions will be at the discretion of the EPA project manager whenever problems appear that could adversely affect data quality and/or resulting decisions affecting future response actions pertaining to the site.

☐ Other (Describe):

3.2 Reports to Management:

☐ Audit Report ☐ Data Validation Report ☐ Project Status Report ☐ None Required

☒ A letter report describing the sampling techniques, locations, problems encountered (with resolutions to those problems), and interpretation of analytical results will be prepared by START and submitted to the EPA

☐ Other (Describe):

Region 7 Superfund Program
Quality Assurance Project Plan Form
for the United Zinc #1 Site

4.0 Data Validation and Usability:

4.1 Data Review, Validation, and Verification Requirements: ☐ Identified in attached table.

☒ Data review and verification will be performed by a qualified analyst and the laboratory's section manager as described in Region 7 EPA SOPs 2430.05C and 2430.12E.

☐ Other (Describe):

4.2 Validation and Verification Methods: ☐ Identified in attached table.

☒ The data will be validated in accordance with Region 7 EPA SOPs 2430.05C and 2430.12E

☒ The EPA project manager will inspect the data to provide a final review. The EPA project manager will review the data, if applicable, for laboratory spikes and duplicates, laboratory blanks, and field blanks to ensure the data are acceptable. The EPA project manager will also compare the sample descriptions with the field sheets for consistency, and will ensure appropriate documentation of any anomalies in the data

☐ Other (Describe):

4.3 Reconciliation with User Requirements:

☒ If data quality indicators do not meet the project's requirements as outlined in this QAPP, the data may be discarded and re-sampling or re-analysis of the subject samples may be required by the EPA project manager.

☐ Other (Describe):

Region 7 Superfund Program
Quality Assurance Project Plan Form
for the United Zinc #1 Site

Table 1: Sample Summary

Site Name: United Zinc #1 Site		**Location:** Iola, Allen County, Kansas; see Figure 1.	
START Project Manager: Rick Claytor		**Activity/ASR #:** To be determined	**Date:** 04/03/2006

No. of Samples	Matrix	Location	Purpose	Depth or other Descriptor	Requested Analysis	Sampling Methods	Analytical Method
180	Soil	Residential yards, school yards, parks, daycare centers	to confirm XRF readings obtained in the field	0-2 inches	arsenic, cadmium, zinc, lead	EPA SOPs 4231.1707 & 4231.2012	EPA Method 3050B/6010B
10	Water	Private drinking water wells in the study area	to determine whether a release to drinking water supplies has occurred	N/A	arsenic, cadmium, zinc, lead (total)	EPA SOP 4230.10A	EPA Method 6020
QC Samples							
18	Soil	Field duplicates – soil sampling locations	to assess the precision of analytical and sampling methods	0-2 inches	arsenic, cadmium, zinc, lead	EPA SOPs 4231.1707 & 4231 2012	EPA Method 3050B/6010B
1	Water	Field duplicate – private drinking water well	to assess the precision of analytical and sampling methods	N/A	arsenic, cadmium, zinc, lead (total)	EPA SOP 4230.10A	EPA Method 6020
1	Water	field blank	to assess field-introduced and lab-introduced contamination	N/A	arsenic, cadmium, zinc, lead (total)	N/A	EPA Method 6020
Background Samples							
3	Soil	Outside suspected influence of former smelter operations	To determine background levels in soil for the contaminants of concern	0-2 inches	arsenic, cadmium, zinc, lead	EPA SOPs 4231.1707 & 4231.2012	EPA Method 3050B/6010B
1	Water	Private well upgradient of study area	To determine background levels in groundwater for the contaminants of concern	N/A	arsenic, cadmium, zinc, lead (total)	EPA SOP 4230.10A	EPA Method 6020

Table 2: Data Quality Objective Summary

Site Name: United Zinc #1 Site		**Location:** Iola, Allen County, Kansas; see Figure 1.	
START Project Manager: Rick Claytor		**Activity/ASR #:** To be determined	**Date:** 04/03/2006

Analysis	Analytical Method	Data Quality Measurements					Sample Handling Procedures	Data Management Procedures
		Accuracy	Precision	Representativeness	Completeness	Comparability		
SOIL								
arsenic, cadmium, zinc, lead	see Table 1	per analytical method	per analytical method	judgmental sampling based on professional judgment	100%; samples from residential properties are critical samples	standardized procedures for sample collection and analysis will be used	see Section 2.3 of QAPP form	see Section 2.10 of QAPP form
WATER								
arsenic, cadmium, zinc, lead (total)	see Table 1	per analytical method	per analytical method	judgmental sampling based on professional judgment	100%; samples from private drinking water wells are critical samples	standardized procedures for sample collection and analysis will be used	see Section 2.3 of QAPP form	see Section 2.10 of QAPP form

APPENDIX A

SITE-SPECIFIC INFORMATION FOR AN INTEGRATED SITE ASSESMENT OF THE UNITED ZINC #1 SITE

INTRODUCTION

The Tetra Tech EM Inc. (Tetra Tech) Superfund Technical Assessment and Response Team (START) has been tasked by the U.S. Environmental Protection Agency (EPA) Region 7 Superfund Division to conduct an integrated removal site evaluation and preliminary assessment (i.e., integrated site assessment [ISA]) at the United Zinc #1 site. From 1902 until 1912, the United Zinc and Chemical Company utilized the site for lead and zinc smelting and processing operations. The purpose of this investigation is to evaluate whether any threats to human health or the environment exist because of possible impacts of these activities on surface soils and groundwater.

The ISA will include collection of the following samples: surface soil samples from residential yards, schoolyards, and daycare centers; and groundwater samples from private wells. This Quality Assurance Project Plan (QAPP) identifies site-specific features and addresses elements of the sampling strategy and analytical methods proposed for this investigation. An analysis of the data acquired during this project will proceed according to 40 CFR 300.410 to determine the need for a removal action, and 40 CFR 300.420 to address pre-remedial issues, as specified in the National Oil and Hazardous Pollution Contingency Plan (NCP).

SITE LOCATION/DESCRIPTION

The site is located in a mixed residential and commercial area on the east side of Iola, Kansas (see Appendix B, Figure 1). The initial study area will target a 0.25-mile radius around the former United Zinc and Chemical Company property. The United Zinc #1 site covers approximately 17 acres, much of which is now vacant. Businesses currently on the site include: Brentagg Southwest, Inc., MFA, Superflea Flea Market, Tucker's Flea Market, and a portion of a concrete plant.

PREVIOUS INVESTIGATIONS

Under the Kansas Department of Health and Environment's (KDHE) State Water Plan (SWP) program, a Phase I Focused Former Smelter Assessment was completed at the United Zinc #1 site in December 2003. The assessment identified the site as a potential source of heavy metals contamination due to the historical activities at the site. In December 2004, a KDHE contractor conducted a Phase II assessment at the site and identified elevated concentrations of lead, cadmium, arsenic, and zinc on the former United Zinc and Chemical Company property. Concentrations of those metals were detected as high as 49,000 milligrams per kilogram (mg/kg) for lead, 380 mg/kg for cadmium, 1,800 mg/kg for arsenic, and 52,000 mg/kg for

zinc. The assessment also identified the potential for elevated levels of lead on nearby residential, school, and day care properties.

In June 2005, KDHE screened the right-of-ways of 50 residential properties around the United Zinc #1 site. Discrete surface soil samples were collected at each property and analyzed (using both field screening and laboratory methods) for lead, arsenic, cadmium, and zinc. The results of this investigation identified lead-contaminated surface soils (i.e., exceeding 400 mg/kg) at 36 percent of the properties. Relative concentrations of the other metals of concern typically mimicked the lead levels.

In September 2005, a Preliminary Removal Site Evaluation was conducted by a KDHE contractor at sensitive receptor areas identified during previous investigations. This involved the collection of discrete soil samples from the McKinley Elementary School and the Iola Preschool. Lead concentrations greater than 400 mg/kg were identified in soils on and adjacent to the McKinley Elementary School property; however, no elevated concentrations of metals were found in the samples collected from the Iola Preschool.

SAMPLING STRATEGY AND METHODOLOGY

In support of EPA, under this task order, Tetra Tech START will conduct sampling at properties in Iola, Kansas, to determine the extent of metals contamination in surface soils and groundwater. The extent of contamination will be further refined as additional screening and analytical data become available.

Sampling procedures will follow standard operating procedures (SOP) outlined in the QAPP. In addition, soil sampling and screening activities will be conducted in accordance with the guidelines established in the Superfund Lead-Contaminated Residential Sites Handbook. Sampling activities will require four to five START personnel and will include collection of surface soil samples and groundwater samples from private wells, if any are located in the study area. Properties within 0.25 mile of the former United Zinc and Chemical Company property will be initially targeted for sampling. Descriptions of the sampling strategy and procedures are presented below.

Soil Sampling and Field Screening – The Tetra Tech START crew will conduct soil sampling and field screening activities at approximately 300 residential properties, schoolyards, parks, and daycare centers. At each property, after receiving consent from the owner, Tetra Tech START will divide the property into distinct cells for screening purposes. While the maximum size of a cell will be 100 by 100 feet, the actual size of cells will be determined in the field based on site features. A cell will extend from the circumference defined by the drip zone around the building or house in all directions 100 feet or to the

property line, whichever distance is shorter. Additional areas or cells to be screened include: the drip zone; fine-grained material if used for driveways, sidewalks, or under carports; vegetable gardens; and children's play areas at least 25 by 25 feet. A composite sample consisting of nine aliquots, each collected from 0 to 2 inches below ground surface (bgs), will be collected in each cell and placed in a labeled, sealed plastic bag. Three separate readings for the metals of interest will be taken of each homogenized sample using a field portable x-ray fluorescence (XRF) analyzer; these readings will be recorded in the appropriate cell on the field sheet for that property. The average of these three readings will be calculated and also recorded on the field sheet. Approximately 10 percent of the screened samples will be submitted for laboratory confirmation analyses of arsenic, zinc, cadmium, and lead. The XRF data will be considered valid if a comparison between the XRF values and the corresponding laboratory results yields a regression coefficient (r^2) of at least 0.7.

Private Drinking Water Well Samples – Most drinking water in the study area is supplied by Iola's municipal system. However, if any private drinking water wells are identified in the study area, Tetra Tech START will make every effort to sample these wells in accordance with the following procedures. Samples will be collected from taps or spigots near the wellheads and prior to any home treatment systems, wherever possible. The supply lines will be purged for 5 minutes before the samples are collected. Available well construction and aquifer data will be recorded on the field sheets. Water samples will be collected in 1-liter cubitainers and preserved with nitric acid at a pH less than 2. All water samples will be maintained at or below a temperature of 4 degrees Celsius (□C) and submitted to the laboratory for analyses of total arsenic, zinc, cadmium, and lead. For each sample from a private drinking water well, the following information will be included on the field sheet, if known: property owner information (name, address, and phone number); number and ages of persons using the well; well depth; depth to water; presence and type of treatment system; and sampling location.

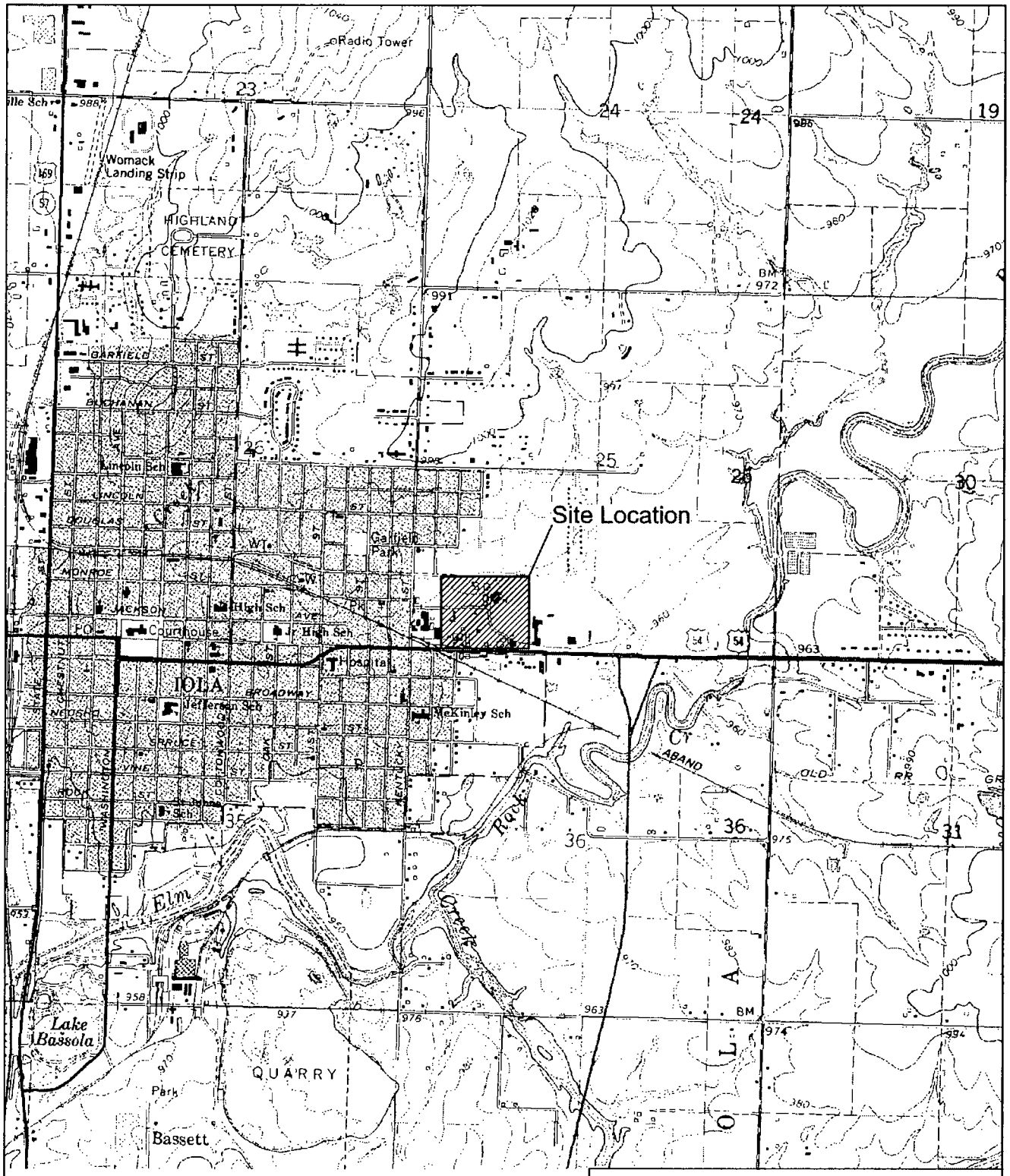
Quality Control Samples – Field duplicates will be collected of the sampled matrices (soil and drinking water) at a frequency of 10 percent of samples submitted for laboratory analysis. Data from these duplicate pairs will be evaluated to determine total method precision of field procedures and laboratory analyses. One field blank (water) will also be submitted for laboratory analysis to evaluate potential contamination introduced during the sampling and/or laboratory procedures. Background samples of surface soil and groundwater will be collected from locations determined to be outside the influence of former smelting activities conducted at the United Zinc #1 site. Proposed for this ISA are the collection of one background groundwater sample and three background soil samples from locations to be identified during the sampling activities.

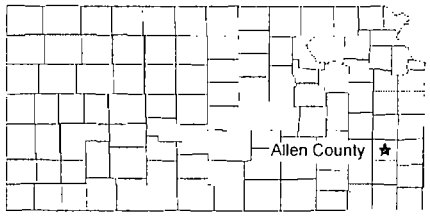
ANALYTICAL METHODS

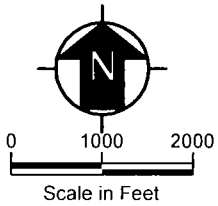
An Analytical Services Request (ASR) form will be completed by the EPA project manager and submitted to the EPA Region 7 laboratory prior to field activities. Appropriate containers and physical and chemical preservation techniques will be employed during the field activities to help verify acquisition of representative analytical results. All samples will be submitted to the EPA Region 7 laboratory in Kansas City, Kansas, for analyses of arsenic, zinc, cadmium, and lead, according to the SOPs and methods referenced or described in the QAPP form. As tentatively scheduled, START will periodically submit samples to the laboratory starting on April 14, 2006.

APPENDIX B

SITE AREA MAP







Source: USGS Allen County, KS 7.5 Minute Topo Quad, 1959, PR 1984

United Zinc #1 Smelter Site
Iola, Kansas

Figure 1
Site Location Map

Tetra Tech EM Inc.

Date 04 5/06 Drawn By Bill Spiegel Project No 19004 L06 0011 000

G:\G\9004 0011\000\dwg\figure1.dwg

Appendix F: *Phase II Focused Former Smelter Assessment of the Former United Zinc #1 Smelter, Iola, Kansas*

Prepared by Burns and McDonnell Engineering Company for KDHE, December, 2004

Site: United Zinc #1
ID # KSN000705026
Break: 1.0
Other: 12-2004

8

40249506
SUPERFUND RECORDS

RECEIVED
DEC 0 3 2004
BUREAU OF
ENVIRONMENTAL REMEDIATION

PHASE II
FOCUSED FORMER SMELTER ASSESSMENT
OF THE
FORMER UNITED ZINC #1 SMELTER
IOLA, KANSAS

DECEMBER 2004

Burns & McDonnell Project No. 35833
Kansas Department of Health & Environment
State Water Plan Program
KDHE Project #C300171726

Burns & McDonnell Engineering Company, Inc.
Engineers-Geologists-Scientists
Kansas City, Missouri

TABLE OF CONTENTS

	Page No.
LIST OF FIGURES	TC-3
LIST OF TABLES	TC-3
LIST OF ACRONYMS AND ABBREVIATIONS	TC-4
1.0 INTRODUCTION	1-1
1.1 Personnel	1-2
2.0 SITE INFORMATION	2-1
2.1 Site Location and Description	2-1
2.2 Background	2-1
3.0 INVESTIGATION ACTIVITIES	3-1
3.1 Utility Clearance	3-1
3.2 Field Sampling	3-1
3.2.1 On-Site Grid – Unbiased Surface Soil	3-2
3.2.2 On-Site Grid – Biased Subsurface Soil	3-3
3.2.3 Smelter Waste	3-3
3.2.4 Surface Water	3-3
3.2.5 Sediment	3-3
3.2.6 Off-Site Surface Soil	3-4
3.2.7 Direct-Push	3-4
3.2.8 Background	3-4
3.2.9 Sensitive Receptors	3-5
3.2.10 Quality Control	3-5
3.3 Temporary Piezometer Surveying	3-5
3.4 Borehole Abandonment	3-5
3.5 IDW Management	3-5
4.0 SAMPLE RESULTS	4-1
4.1 Background Samples	4-1
4.1.1 XRF Results	4-1
4.1.2 Laboratory Results	4-2
4.2 On-Site Grid – Unbiased Surface Soil Samples	4-2
4.2.1 XRF Results	4-2
4.2.2 Laboratory Results	4-2
4.3 On-Site Grid – Biased Subsurface Soil Samples	4-3
4.3.1 XRF Results	4-3
4.3.2 Laboratory Results	4-3
4.4 Smelter Waste Samples	4-3
4.4.1 XRF Results	4-3
4.4.2 Laboratory Results	4-4
4.5 Surface Water Samples	4-4
4.6 Sediment Samples	4-4

TABLE OF CONTENTS (continued)

4.6.1 XRF Results 4-4
4.6.2 Laboratory Results 4-4
4.7 Off-Site Surface Soil Samples 4-4
4.7.1 XRF Results 4-4
4.7.2 Laboratory Results 4-5
4.8 Direct-Push Samples 4-5
4.8.1 XRF Results 4-5
4.8.2 Laboratory Results 4-5
4.9 Sensitive Receptor Samples 4-6
4.9.1 XRF Results 4-6
4.9.2 Laboratory Results 4-6
4.10 Quality Control Samples 4-6

5.0 CONCLUSIONS AND RECOMMENDATIONS 5-1
5.1 Conclusions 5-1
5.2 Recommendations 5-2

6.0 REFERENCES 6-1

APPENDICES

A – Field Logbook
B – Color Photographic Log
C – Boring Logs
D – Laboratory Analytical Results

LIST OF FIGURES

(All figures follow text of the Phase II FFSA)

Figure No.	Title
1-1	Regional Map
3-1	Unbiased Surface Soil Sample Locations
3-2	Biased Soil and Smelter Waste Sample Locations
3-3	Sediment and Surface Water Sample Locations
3-4	Off-Site Surface Soil and Direct-Push Sample Locations
3-5	Background Sample Locations
3-6	Sensitive Receptor Sample Locations

LIST OF TABLES

(All tables follow figures of the Phase II FFSA)

Table No.	Table
3-1	Sample Results with XRF
4-1	Soil Laboratory Analytical Results
4-2	Water Laboratory Analytical Results

LIST OF ACRONYMS AND ABBREVIATIONS

BER	Bureau of Environmental Remeditation
bgs	Below ground surface
Burns & McDonnell	Burns & McDonnell Engineering Company, Inc.
EPS	Environmental Priority Service, Inc. of Salina, Kansas
EPA	Environmental Protection Agency
ESC	Environmental Science Corporation of Mt. Juliet, Tennessee
°C	Degrees Celcius
FFSA	Focused Former Smelter Assessment
GPS	Global positioning system
HPLC	High performance liquid chromatography
IDW	Investigation derived waste
KDHE	Kansas Department of Health and Environment
mg/kg	Milligrams per kilogram
mg/l	Milligrams per liter
RSK	Kansas risk-based standards
Site	Former United Zinc #1 Smelter, Iola, Allen County, Kansas
WP	Work Plan
XRF	X-ray fluorescence technology

* * * * *

1.0 INTRODUCTION

The following report presents the results of Phase II Focused Former Smelter Assessment (FFSA) investigation activities conducted by Burns & McDonnell Engineering Company, Inc. (Burns & McDonnell) personnel from October 28 to November 5, 2004, at the former United Zinc #1 Smelter located at Kansas Drive and United States Highway 54 in Iola, Kansas (Site). Burns & McDonnell submitted a Work Plan, dated March 2004, for Phase II Smelter Assessments (Group C) at thirteen former smelter sites in Cherokee, Girard, Pittsburg, Scammon, Weir, Iola, and La Harpe, Kansas, to the Kansas Department of Health of Environment (KDHE) Bureau of Environmental Remediation (BER). KDHE BER approved the Work Plan in a letter dated March 29, 2004. Figure 1-1 illustrates the general location of the Site.

This report provides a summary of the field activities, and associated field and laboratory analytical results obtained during the Phase II FFSA. The objectives of the Phase II FFSA were as follows:

1. Provide information regarding areas of *Recognized Environmental Conditions* and areas of concern that were identified during the Phase I FFSA.

These objectives were met by sampling soil, smelter waste, groundwater, surface water, and sediment at on- and off-Site locations. Soil, smelter waste, and sediment samples were analyzed using x-ray fluorescence (XRF) technology. The portable XRF provided arsenic, cadmium, lead, and zinc concentrations in the samples following United States Environmental Protection Agency (EPA) Method 6200. Select soil, smelter waste, groundwater, surface water, and sediment samples were submitted to Environmental Science Corporation (ESC) of Mt. Juliet, Tennessee, for laboratory analysis of arsenic, cadmium, lead, and zinc using EPA method 6010B.

On October 29, 2004, Burns & McDonnell personnel and personnel from Environmental Priority Service, Inc. (EPS) of Salina, Kansas, mobilized to the Site to perform direct-push sampling activities. A total of three soil samples were collected using direct-push sampling techniques and submitted to ESC for laboratory analysis of arsenic, cadmium, lead, and zinc. Temporary piezometers were installed in the direct-push borings and groundwater samples were collected from the piezometers on November 5, 2004. The groundwater samples were submitted to ESC for laboratory analysis of arsenic, cadmium, lead, and

zinc. In addition, the temporary piezometers were surveyed relative to a temporary benchmark to determine groundwater flow direction at the Site.

All field work was conducted in accordance with the KDHE approved Burns & McDonnell Work Plan (WP) dated March 2004.

1.1 PERSONNEL

The following is a listing of project personnel and subcontractors:

Bridget Wilson, KDHE Project Manager

Steve Hoffine, Burns & McDonnell Project Manager

Keith Schutte, Burns & McDonnell Field Site Manager

EPS of Salina, Kansas, Direct-push Contractor

ESC of Mt. Juliet, Tennessee, Analytical Laboratory Contractor

* * * * *

Page 8 of 32

2.0 SITE INFORMATION

2.1 SITE LOCATION AND DESCRIPTION

A portion of the information in this section is taken from the Maxim Technologies, Inc. (Maxim) FFSA Phase I report for the United Zinc #1 in Iola, Kansas. The Site is located on both the northwest and northeast corners of the intersection of Kansas Drive and East Street (Highway 54) in Iola, Allen County, Kansas, 66749. The geographic description of the Site is the south $^1/_2$ of the southwest ¼ and the southeast ¼ of the southwest ¼ of Section 25, Township 24 South, Range 18 East. An area map depicting the Site location regionally is included as Figure 1-1.

The Site is comprised of approximately 17 acres of land and includes ten separate parcels of land. The Site is comprised of a vacant piece of property (owned by Mr. Scott Mueller), Brenntag Southwest, Inc. (Brenntag), MFA, Superflea Flea Market, Tucker's Flea Market, a portion of a concrete mixing facility, and a section of pastureland. Maxim reported in the Phase II FFSA for the Site that smelter waste at the Site appeared to be concentrated in the southwest corner of the Scott Mueller property. During a July 12, 2004, Site reconnaissance Burns & McDonnell personnel confirmed the majority of smelter waste at the Site was located on the Mueller property. Based on field measurements collected by Burns & McDonnell personnel on November 5, 2004, the estimated volume of smelter waste at the Site is approximately 1,800 cubic yards (yds^3). This estimate was based on measuring a smelter waste pile at the Site and assuming the pile extended 2 feet below current grade. It is undetermined how much smelter waste is buried at the Site and the estimated volume of 1,800 yds^3 should be considered approximate.

Burns & McDonnell attempted to obtain access to each property at the Site for the Phase II investigation. Access for the Phase II investigation was obtained only for the Mueller, Brenntag, and MFA properties.

2.2 BACKGROUND

Maxim conducted a Phase I FFSA of the Site and a *Recognized Environmental Condition* was revealed. During the Phase I FFSA Site reconnaissance conducted in June 2003, slag piles and scattered slag were found at the Site and appeared to have impacted vegetation growth in the area of former smelter operations. The Phase I FFSA report, dated December 19, 2003, summarizing the full Site history is on file with KDHE.

* * * * *

3.0 INVESTIGATION ACTIVITIES

The following sections provide a description of the field activities conducted as part of the Phase II FFSA from October 28 to November 5, 2004. Field activities included soil, smelter waste, groundwater, surface water, and sediment sampling, temporary piezometer installation and surveying, borehole abandonment, and investigation derived waste (IDW) management. Field activities were recorded in the field logbook, a copy of which is provided in Appendix A. Photographs of the Site and activities are provided in Appendix B.

3.1 UTILITY CLEARANCE

Prior to commencement of any direct-push sampling, representatives of the utilities were contacted through Kansas One-Call. An on-Site meeting between BMcD personnel and utility representatives was arranged and utility representatives were questioned regarding utility locations.

3.2 FIELD SAMPLING

On October 28, 2004, Burns & McDonnell personnel mobilized to the Site to perform field sampling activities. Burns & McDonnell personnel analyzed soil and smelter waste samples at the Site using XRF technology. The portable XRF was calibrated at the beginning of each day, during active sample analyses, and at the end of the day. Per EPA Method 6200 guidelines, the XRF was allowed to warm up for 15 to 30 minutes prior to use. The portable XRF provided arsenic, cadmium, lead, and zinc concentrations in the samples following EPA Method 6200. Select soil, smelter waste, groundwater, surface water, and sediment samples were submitted to ESC for laboratory analysis of arsenic, cadmium, lead, and zinc using EPA method 6010B.

Surface soil and smelter waste samples were screened in-situ using the portable XRF. Subsurface soil and sediment samples were "prepared" before XRF analysis. The samples were "prepared" in the following manner:

- Approximately 8 ounces (375 grams) of sample was thoroughly mixed and homogenized prior to analysis.
- Approximately 20 to 50 grams of sample was then dried using a toaster oven to a temperature not greater than 150 °C (degrees Celsius) for approximately 2 to 4 hours.

- Samples were then ground using a mortar and pestle and sieved using 60-mesh (0.25 millimeter) stainless steel, nylon or equivalent mesh prior to field XRF analysis, as specified in EPA Method 6200.
- A portion of the sample was then placed in a sample cup, covered with 2.5-micrometer film, and analyzed using the portable XRF.

Field screening results are summarized in Table 3-1.

On October 29, 2004, Burns & McDonnell and EPS personnel mobilized to the Site to perform direct-push sampling activities. Burns & McDonnell personnel field screened recovered soil using the portable XRF. A total of three soil samples were collected by direct-push sampling techniques and submitted to ESC for laboratory analysis of arsenic, cadmium, lead, and zinc. Temporary piezometers were installed in the direct-push borings and Burns & McDonnell personnel collected groundwater samples from the piezometers on November 5, 2004. The groundwater samples were submitted to ESC for laboratory analysis of arsenic, cadmium, lead, and zinc.

A Trimble Pro-XRS global positioning system (GPS) backpack unit was used to record sample locations in the field. All field work was conducted in accordance with the KDHE approved Burns & McDonnell WP dated March 2004.

3.2.1 On-Site Grid – Unbiased Surface Soil

An approximate 100-foot sampling grid was created at the Site and 34 surface soil sample locations (SS-1 through SS-34) were designated. Surface soil was screened in-situ using the portable XRF. In addition, Surface Soil Samples SS-1, SS-2, SS-7, SS-16, and SS-34 were submitted to ESC for laboratory analysis of arsenic, cadmium, lead, and zinc.

At each grid location three readings were collected over a 1- to 2-foot radius. Any large or non-representative debris was removed from the soil surface before analysis. If the soil surface was not smooth, a decontaminated, stainless-steel trowel was used to level the surface. If an in-situ screening could not be conducted at a particular grid sample location, the sample area was disturbed to a depth of up to six inches to get an accurate, representative sample. Unbiased surface soil sample locations are illustrated on Figure 3-1. ?

3.2.2 On-Site Grid – Biased Subsurface Soil

After obtaining unbiased grid samples, biased subsurface soil samples were collected at 7 locations (HS-1 through HS-7) in the vicinity of the highest metal concentrations observed during field screening. The biased soil samples were "prepared" prior to XRF analysis. Soil Samples HS-2/SS-1, HS-3/SS-1, HS-5/SS-1, and HS-7/SS-1 were submitted to ESC for laboratory analysis of arsenic, cadmium, lead, and zinc. Biased soil sample locations are illustrated on Figure 3-2.

The biased soil samples were collected by Burns & McDonnell personnel using a decontaminated, stainless steel Oakfield Probe. Shallow subsurface soil samples were collected using the Oakfield probe from depths of 0 to 3 feet below ground surface (bgs) at 1-foot intervals. A total of three samples were collected per location, with the exception of Borings HS-5 and HS-7, where refusal was encountered at 1 foot bgs.

3.2.3 Smelter Waste

Smelter waste samples were collected from four locations (Slag-1 through Slag-4) at the Site. Smelter waste samples were field screened in-situ using XRF technology and Smelter Waste Sample Slag-2 was submitted to ESC for laboratory analysis of arsenic, cadmium, lead, and zinc. Smelter waste sample locations are illustrated on Figure 3-2.

3.2.4 Surface Water

Two surface water samples were collected at the Site. Surface Water Samples SW-1 and SW-2 were submitted to ESC for laboratory analysis of arsenic, cadmium, lead, and zinc. Surface water sample locations are illustrated on Figure 3-3.

3.2.5 Sediment

Two sediment samples were collected at the Site. Sediment Samples SED-1 and SED-2 were collected, "prepared", and analyzed in the field using the portable XRF.. In addition, Sediment Sample SED-1 was submitted to ESC for laboratory analysis of arsenic, cadmium, lead, and zinc. Sediment sample locations are illustrated on Figure 3-3.

3.2.6 Off-Site Surface Soil

A total of 8 surface soil sample locations (Sample Locations PS-1 through PS-8) were selected from surrounding off-Site locations and field screened in-situ using the portable XRF. At each sample location three readings were collected over a 1- to 2-foot radius. The off-Site surface soil samples were collected and analyzed with the XRF in the same manner as the on-Site surface soil samples. Soil Sample PS-5 was submitted to ESC for laboratory analysis of arsenic, cadmium, lead, and zinc. Off-Site surface soil sample locations are illustrated on Figure 3-4.

3.2.7 Direct-Push

A total of three direct-push borings (Borings GP-1 through GP-3) were completed at the Site. Each location was continuously sampled to bedrock refusal; bedrock was encountered from 14 to 16 feet bgs in the borings. One soil sample was collected from each 5-foot interval for field XRF analysis. The sample from each borehole exhibiting the highest concentration of metals based on field screening (Soil Samples GP-1/SS-1, GP-2/SS-1, and GP-3/SS-1) was collected for submittal to ESC for laboratory analysis of arsenic, cadmium, lead, and zinc.

Following collection of the soil cores from the direct-push borings, temporary 1-inch diameter poly vinyl chloride (PVC) piezometers were installed in the boreholes. Groundwater samples were collected from the temporary piezometers in Borings GP-1, GP-2, and GP-3, field filtered, and submitted to ESC for laboratory analysis of arsenic, cadmium, lead, and zinc. Boring logs of the direct-push sample locations are included in Appendix C and direct-push sample locations are illustrated on Figure 3-4.

3.2.8 Background

Background surface soil was screened in-situ using the portable XRF. Background subsurface soil and sediment samples (with the exception of Background Sediment Sample SED-3) were "prepared" and analyzed using the portable XRF. Background Sediment Sample SED-3 was collected on November 5, 2004, after the rented XRF was returned to the manufacturer. Background Sediment Sample SED-3 and Background Surface Water Samples BKG-1/SW-1 and BKG-2/SW-2 were submitted to ESC for laboratory analysis of arsenic, cadmium, lead, and zinc. Background sample locations are illustrated on Figure 3-5.

3.2.9 Sensitive Receptors

Surface soil was screened in-situ using the portable XRF at a total of four sensitive receptor locations. Sensitive Receptor Samples ENV-1 and ENV-2 were collected from the City of Iola right-of-way next to the McKinley Elementary School property. Sensitive Receptor Samples ENV-3 and ENV-4 were collected from the City of Iola right-of-way next to the Iola Preschool for the Exceptional. In addition, Sensitive Receptor Sample ENV-1 was submitted to ESC for laboratory analysis of arsenic, cadmium, lead, and zinc. Sensitive receptor sample locations are illustrated on Figure 3-6.

3.2.10 Quality Control

One duplicate sample, collected as a split of the original sample, was used to evaluate the precision of the field sampling and laboratory analyses. Duplicate Sample DUP-1 collected as a split of Surface Soil Sample SS-1 was submitted to ESC for laboratory analysis of arsenic, cadmium, lead, and zinc.

3.3 TEMPORARY PIEZOMETER SURVEYING

Burns & McDonnell personnel surveyed the three temporary piezometers relative to a temporary benchmark of 100 feet. Water levels were measured in each of the piezometers. The top of casing elevations measured were used to establish groundwater elevations in each piezometer. Based on the groundwater elevations, it appears groundwater at the Site flows towards the south.

3.4 BOREHOLE ABANDONMENT

Following completion of sample collection and removal of the temporary piezometers from the direct-push borings, the boreholes were abandoned by filling the hole with bentonite. The upper 6 inches of each borehole was returned to its original condition.

3.5 IDW MANAGEMENT

The minimal amounts of soil cuttings generated during the Phase II FFSA were spread on-Site and the purge and decontamination water generated was discharged to the ground surface. All other IDW generated, including personal protective equipment, paper towels, etc., was placed in trash bags and left in an appropriate solid waste receptacle.

* * * * *

4.0 SAMPLE RESULTS

Analytical results for arsenic were compared to the KDHE Risk-Based Standards for Kansas (RSK) Residential Soil to Ground Water Protection Pathway. Because KDHE RSK Residential Soil to Ground Water Protection Pathway values are not available for cadmium, lead, and zinc, KDHE RSK Residential Soil Pathway levels were used for comparison of cadmium, lead, and zinc concentrations. The applicable KDHE RSK for soil [in milligrams per kilogram (mg/kg)] and water [in milligrams per liter (mg/l)] for the Site follow:

Analyte Name	KDHE RSK (soil)	KDHE RSK (water)
Arsenic	5.84 mg/kg	0.01 mg/l
Cadmium	39 mg/kg	0.005 mg/l
Lead	400 mg/kg	0.015 mg/l
Zinc	23,000 mg/kg	5 mg/l

Section 4.1 discusses metals detected in samples collected from background locations. The remaining sections discuss only metals concentrations in samples that exceed KDHE RSK levels. Please note that detection limits for arsenic and cadmium in all the samples analyzed with the portable XRF were above KDHE RSK for arsenic and cadmium. Sample results obtained with the portable XRF are summarized in Table 3-1. Laboratory analytical results of soil samples are summarized in Table 4-1 and laboratory analytical results of water samples are summarized in Table 4-2. Laboratory analytical reports are included in Appendix D.

4.1 BACKGROUND SAMPLES

4.1.1 XRF Results

Field XRF results indicate arsenic was not detected in background surface, subsurface, and sediment samples. Cadmium was detected at Background Surface Soil Sample Locations SS1 and SS2 at concentrations of 203 mg/kg and 54 mg/kg, respectively. Cadmium was detected in Background Subsurface Soil Samples BGS-1/SS-1 (118 mg/kg), BGS-1/SS-2 (122 mg/kg), and BGS-2/SS-1 (93 mg/kg). Cadmium was not detected in the background sediment samples. Lead was detected at Background Surface Soil Sample Location SS1 at concentration of 32 mg/kg. Lead was detected in the background subsurface soil samples at concentrations ranging from 52 mg/kg in Sample BGS-2/SS-2 to 30 mg/kg in Sample BGS-1/SS-2. Lead was detected in Background Sediment Samples BSED-1 and

BSED-2 at concentrations of 72 mg/kg and 49 mg/kg, respectively. Zinc was detected in Background Surface Soil Sample Locations SS1 and SS2 at concentrations of 70 mg/kg and 88 mg/kg, respectively. Zinc was detected in the background subsurface soil samples at concentrations ranging from 108 mg/kg in Sample BGS-2/SS-1 to 50 mg/kg in Sample BGS-2/SS-2. Zinc was detected in Background Sediment Samples BSED-1 and BSED-2 at concentrations of 73 mg/kg and 125 mg/kg, respectively.

4.1.2 Laboratory Results

Laboratory analytical results of Background Surface Water Samples BKG-1/SW-1 and BKG-2/SW-2 indicate arsenic and cadmium were not detected above laboratory reporting limits. Lead was detected in Samples BKG-1/SW-1 and BKG-2/SW-2 at concentrations of 0.010 mg/l and 0.0070 mg/l, respectively. Zinc was detected in Sample BKG-2/SW-2 at a concentration of 0.042 mg/l. Zinc was not detected above laboratory reporting limits in Background Surface Water Sample BKG-1/SW-1.

4.2 ON-SITE GRID – UNBIASED SURFACE SOIL SAMPLES

4.2.1 XRF Results

Field screening results obtained using the portable XRF indicated arsenic was detected at concentrations exceeding KDHE RSK for arsenic at 18 surface soil sample locations with concentrations ranging from 1,679 mg/kg at Sample Location SS-17 to 9.4 mg/kg at Sample Location SS-5. Cadmium concentrations exceeded KDHE RSK for cadmium at 30 unbiased surface soil sample locations with concentrations ranging from 271 mg/kg at Sample Location SS-19 to 47 mg/kg at Sample Location SS-22. Lead concentrations exceeded KDHE RSK for lead at 30 of 34 unbiased surface soil sample locations. Lead concentrations exceeding KDHE RSK for lead ranged from 30,285 mg/kg at Sample Location SS-17 to 412 mg/kg at Sample Location SS-30. Zinc concentrations exceeded KDHE RSK for zinc at 5 unbiased surface soil sample locations with concentrations ranging from 39,942 mg/kg at Sample Location SS-6 to 23,963 mg/kg at Sample Location SS-19.

4.2.2 Laboratory Results

Laboratory analytical results of the biased surface soil samples indicate arsenic was detected at concentrations exceeding KDHE RSK for arsenic in every sample at concentrations ranging from 56 mg/kg in Sample SS-34 to 7.6 mg/kg in Sample SS-16. Cadmium was detected at concentrations exceeding KDHE RSK for cadmium in Samples SS-1 (46 mg/kg) and SS-34 (39 mg/kg). Lead was detected at concentrations exceeding KDHE RSK for lead in 4 of 5 biased surface soil samples with

concentrations ranging from 14,000 mg/kg in Sample SS-34 to 1,200 mg/kg in Sample SS-2. Zinc was not detected in the biased surface soil samples at concentrations exceeding KDHE RSK for zinc.

4.3 ON-SITE GRID – BIASED SUBSURFACE SOIL SAMPLES

4.3.1 XRF Results

Results of the "prepared" biased shallow subsurface soil samples indicate arsenic was detected at concentrations exceeding KDHE RSK for arsenic in 10 soil samples at concentrations ranging from 872 mg/kg in Soil Sample HS-7/SS-1 to 52 mg/kg in Soil Sample HS-6/SS-2. Cadmium concentrations exceeded KDHE RSK for cadmium in 6 biased soil samples with concentrations ranging from 214 mg/kg in Soil Sample HS-5/SS-1 to 76 mg/kg in Soil Sample HS-6/SS-1. Lead concentrations exceeded KDHE RSK for lead in 10 samples with concentrations ranging from 8,796 mg/kg in Soil Sample HS-4/SS-1 to 618 mg/kg in Soil Sample HS-1/SS-2. Zinc was detected in Soil Samples HS-4/SS-1 and HS-5/SS-1 at concentrations of 34,190 mg/kg and 35,707 mg/kg, respectively, exceeding KDHE RSK for zinc (23,000 mg/kg).

4.3.2 Laboratory Results

Laboratory analytical results of the "prepared" biased soil samples indicate arsenic was detected at concentrations exceeding KDHE RSK for arsenic in every sample with concentrations ranging 1,800 mg/kg in Sample HS-7/SS-1 to 94 mg/kg in Sample HS-3/SS-1. Cadmium was detected at concentrations exceeding KDHE RSK for cadmium in Soil Samples HS-3/SS-1 (46 mg/kg), HS-5/SS-1 (380 mg/kg), and HS-7/SS-1 (150 mg/kg). Lead was detected at concentrations exceeding KDHE RSK for lead in every sample with concentrations ranging from 49,000 mg/kg in Sample HS-7/SS-1 to 6,500 mg/kg in Sample HS-2/SS-1. Zinc was detected at a concentration of 52,000 mg/kg in Sample HS-5/SS-1, exceeding KDHE RSK for zinc.

4.4 SMELTER WASTE SAMPLES

4.4.1 XRF Results

Field screening results of the smelter waste samples obtained using the portable XRF indicate arsenic was detected at concentrations exceeding KDHE RSK for arsenic in Smelter Waste Samples Slag-2 and Slag-3 at concentrations of 779 mg/kg and 146 mg/kg, respectively. Cadmium was detected in Samples Slag-2 and Slag-3 at concentrations of 164 mg/kg and 837 mg/kg, respectively, exceeding the KDHE RSK for cadmium (39 mg/kg). Lead concentrations exceeded KDHE RSK for lead in Smelter Waste Samples Slag-1 (2,085 mg/kg), Slag-2 (9,986 mg/kg), and Slag-3 (1,484 mg/kg). Zinc was detected at

concentrations exceeding KDHE RSK for zinc in Samples Slag-2 and Slag-3 at concentrations of 25,348 mg/kg and 43,472 mg/kg, respectively.

4.4.2 Laboratory Results

Laboratory analytical results of Sample Slag-2 indicate arsenic (91 mg/kg) and lead (12,000 mg/kg) were detected at concentrations exceeding their respective KDHE RSK. Cadmium and zinc were detected at concentrations below their respective KDHE RSK.

4.5 SURFACE WATER SAMPLES

Laboratory analytical results of Surface Water Samples SW-1, SW-2, and SW-3 indicate arsenic, cadmium, lead, and zinc were detected at concentrations below their respective KDHE RSK.

4.6 SEDIMENT SAMPLES

4.6.1 XRF Results

Field screening results of "prepared" sediment samples indicate cadmium was detected in Sediment Sample SED-2 at a concentration of 71 mg/kg, exceeding KDHE RSK for cadmium (39 mg/kg). There were no other exceedences of KDHE RSK in any of the other sediment sample locations.

4.6.2 Laboratory Results

Laboratory analytical results indicate arsenic was detected in Sediment Samples SED-1 and SED-3 at concentrations of 6.6 mg/kg and 6.2 mg/kg, respectively, exceeding KDHE RSK for arsenic. Cadmium, lead, and zinc were detected at levels below their respective KDHE RSK.

4.7 OFF-SITE SURFACE SOIL SAMPLES

4.7.1 XRF Results

Field screening results obtained using the portable XRF indicated the arsenic concentration at Sample Location PS-4 (90 mg/kg) exceeded KDHE RSK for arsenic. Cadmium concentrations exceeded KDHE RSK for cadmium at 7 off-Site surface soil sample locations with concentrations ranging from 159 mg/kg at Sample Location PS-7 to 50 mg/kg at Sample Locations PS-6. Lead was detected in all samples at concentrations ranging from 4,669 mg/kg at Sample Location PS-5 to 421 mg/kg at Sample Location PS-8; 4 off-Site surface soil sample locations exceeded the KDHE RSK for lead. Zinc was not detected at concentrations exceeding KDHE RSK.

4.7.2 Laboratory Results

Laboratory analytical results of the off-Site surface soil samples indicate arsenic was detected in Sample PS-5 at a concentration of 39 mg/kg, exceeding KDHE RSK for arsenic. Lead was detected in Sample PS-5 at concentration of 4,300 mg/kg, exceeding KDHE RSK for lead. Cadmium and zinc were detected at concentrations below their respective KDHE RSK.

4.8 DIRECT-PUSH SAMPLES

4.8.1 XRF Results

Field screening results of "prepared" surface and subsurface soil samples collected by direct-push sampling techniques indicate arsenic was detected at a concentration of 136 mg/kg in Soil Sample GP-2/SS-1 (collected at 0.5 feet bgs), exceeding KDHE RSK for arsenic. Cadmium was detected at concentrations exceeding KDHE RSK for cadmium in four soil samples at concentrations ranging from 164 mg/kg in Soil Sample GP-3/SS-2 (collected at 6 feet bgs) to 53 mg/kg in Soil Sample GP-2/SS-2 (collected at 2 feet bgs). Lead was detected at concentrations exceeding KDHE RSK for lead in Soil Samples GP-1/SS-1 [773 mg/kg (collected at 0.5 feet bgs)] and GP-2/SS-1 [2,841 mg/kg (collected at 0.5 feet bgs)]. Zinc was not detected in the soil samples collected by direct-push sampling techniques at concentrations exceeding KDHE RSK.

4.8.2 Laboratory Results

Soil

Laboratory analytical results of the soil samples collected by direct-push sampling techniques indicate arsenic was detected in Soil Samples GP-1/SS-1 (10 mg/kg), GP-2/SS-1 (35 mg/kg), and GP-3/SS-1 (15 mg/kg), exceeding KDHE RSK for arsenic. Cadmium was detected in Soil Sample GP-3/SS-1 at a concentration of 68 mg/kg, exceeding KDHE RSK for cadmium. Lead was detected at concentrations exceeding KDHE RSK in every sample with concentrations ranging from 2,500 mg/kg in Sample GP-2/SS-1 to 730 mg/kg in Sample GP-1/SS-1. Zinc was not detected at concentrations exceeding KDHE RSK for zinc in the soil samples collected by direct-push sampling techniques.

Groundwater

Laboratory analytical results of the groundwater samples indicate arsenic and zinc were not detected at levels exceeding KDHE RSK for arsenic and zinc. Cadmium was detected in Groundwater Samples GP-2/GW-1 and GP-3/GW-1 at concentrations of 0.0068 mg/l and 0.073 mg/l, respectively, exceeding

KDHE RSK for cadmium. Lead was detected in Groundwater Sample GP-1/GW-1 at a concentration of 0.020 mg/l, exceeding KDHE RSK for lead.

4.9 SENSITIVE RECEPTOR SAMPLES

4.9.1 XRF Results

Field screening results obtained using the portable XRF indicated arsenic and zinc were not detected at concentrations exceeding KDHE RSK in the surface soil samples collected at the sensitive receptor locations. Cadmium was detected at concentrations exceeding KDHE RSK for cadmium at Sensitive Receptor Locations ENV-1 (106 mg/kg), ENV-2 (154 mg/kg), and ENV-4 (102 mg/kg). Lead was detected at concentrations exceeding KDHE RSK for lead at Sensitive Receptor Locations ENV-1 (725 mg/kg) and ENV-2 (414 mg/kg).

4.9.2 Laboratory Results

Laboratory analytical results of Sample ENV-1 indicate arsenic (14 mg/kg) and lead (680 mg/kg) were detected at concentrations exceeding KDHE RSK for arsenic and lead. Cadmium and zinc were detected in Sample ENV-1 at concentrations below their respective KDHE RSK.

4.10 QUALITY CONTROL SAMPLES

Laboratory analytical results of Sample SS-1 and its duplicate (Duplicate Sample DUP-1/SS-1) indicated acceptable correlation.

* * * * *

5.0 CONCLUSIONS AND RECOMMENDATIONS

5.1 CONCLUSIONS

During the Phase I FFSA Site reconnaissance conducted by Maxim personnel in June 2003, slag piles and scattered slag were found across the Site and appeared to have impacted vegetation growth in the area of former smelter operations. From October 28 to November 5, 2004, Burns & McDonnell personnel conducted a Phase II FFSA at the Site.

A portable XRF was used to analyze surface soil, subsurface soil, smelter waste, and sediment samples for arsenic, cadmium, lead, and zinc. Selected samples were submitted to ESC for laboratory analysis of arsenic, cadmium, lead, and zinc. The following samples were collected as part of the Phase II FFSA:

XRF Analysis

- 102 on-Site grid, unbiased surface soil samples (in-situ)
- 17 on-Site grid, biased subsurface soil samples ("prepared")
- 24 off-Site, surface soil samples (in-situ)
- 4 smelter waste samples (in-situ)
- 2 sediment samples ("prepared")
- 13 soil samples collected by direct-push sampling techniques ("prepared")
- 6 background surface soil samples ("prepared")
- 5 background subsurface soil samples ("prepared")
- 2 background sediment samples ("prepared")

Laboratory Analysis

- 5 on-Site grid, unbiased surface soil samples
- 4 on-Site grid, biased soil samples
- 1 smelter waste sample
- 2 sediment samples
- 3 soil samples collected by direct-push sampling techniques
- 3 groundwater samples collected from temporary piezometers
- 1 off-Site surface soil sample

Page 21 of 32

- 3 surface water samples
- 2 background surface water samples
- 1 sensitive receptor sample
- 1 duplicate sample (on-Site grid, surface soil sample)

Soil samples collected at the Site indicate surface and shallow subsurface soil at the Site is impacted with metals (arsenic, cadmium, lead, and zinc). Results of slag analysis suggests elevated metals in the soil are likely related to historical smelter operations. Field screening results obtained using the portable XRF indicate surface soil at the Site exceeds KDHE RSK for arsenic, cadmium, lead, and zinc. Arsenic was detected at concentrations exceeding KDHE RSK for arsenic in a total of 18 out of 34 unbiased surface soil sample locations with concentrations ranging from 1,679 mg/kg to 9 mg/kg. Cadmium was detected at concentrations exceeding KDHE RSK for cadmium in a total of 30 unbiased surface soil sample locations with concentrations ranging from 271 mg/kg to 47 mg/kg. Lead concentrations exceeded KDHE RSK for lead in 30 unbiased surface soil sample locations with concentrations ranging from 30,285 mg/kg to 412 mg/kg. Soil samples collected at the Site generally exhibited arsenic, cadmium, lead, and zinc concentrations well above metals concentrations observed in background soil samples. Several surface soil samples collected from nearby off-Site locations exhibited metals concentrations in exceedence of KDHE RSK.

5.2 RECOMMENDATIONS

Based on the elevated metals concentrations in the surface and shallow subsurface soil at the Site, Burns & McDonnell recommends additional soil sampling to delineate the horizontal and vertical extent of metals impact in the soil at the Site. Laboratory analytical results indicate cadmium and lead were detected at concentrations exceeding KDHE RSKs in the groundwater at the Site. Burns & McDonnell recommends additional groundwater sampling to delineate the horizontal extent of metals-impacted groundwater at the Site.

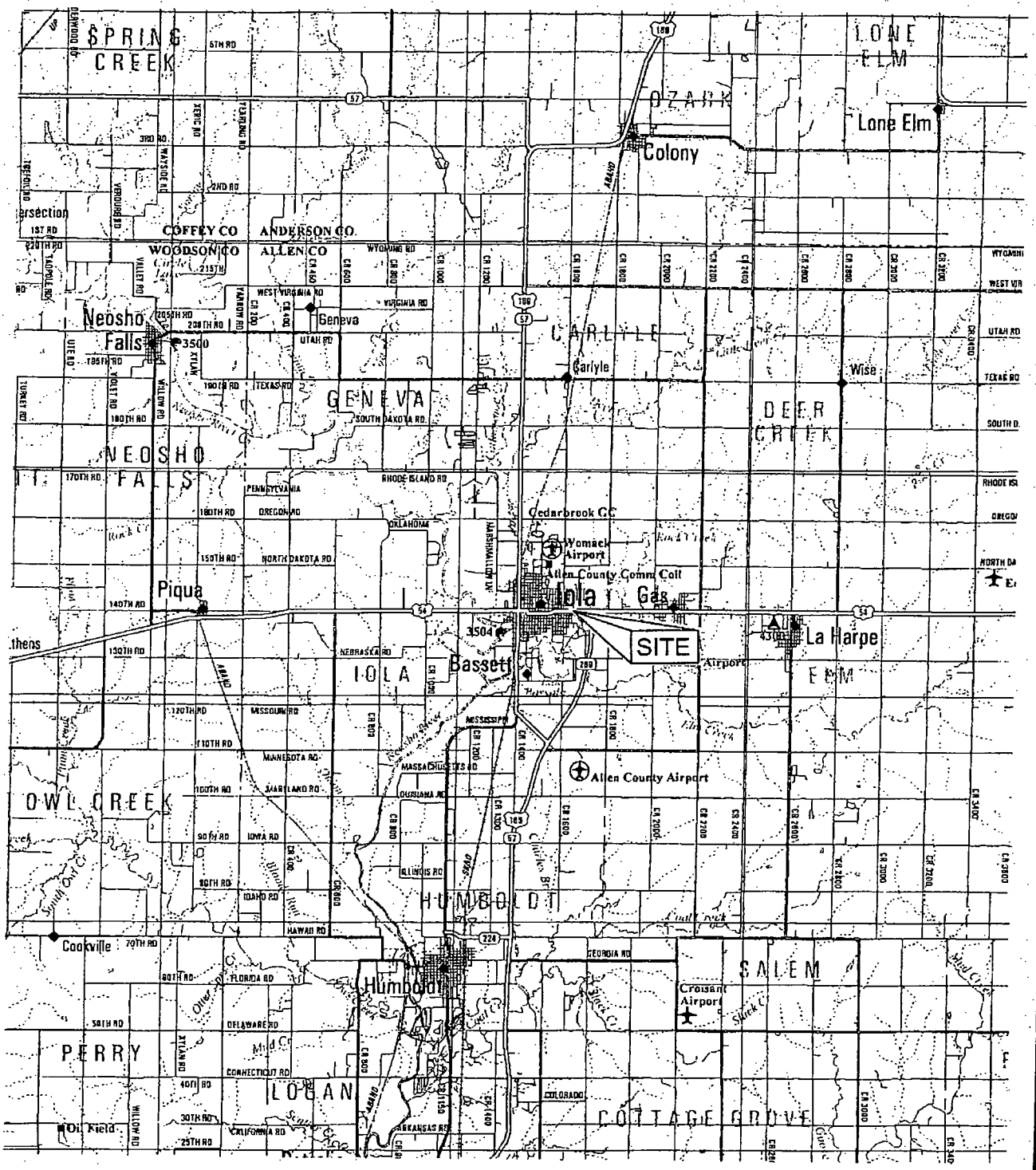
* * * * *

6.0 REFERENCES

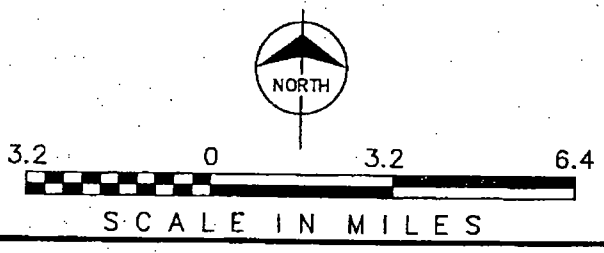
Maxim Technologies, Inc., 2003. Focused Former Smelter Phase I Report, Group B Smelters, United Zinc #1, Iola, Kansas. December.

* * * * *

Figures



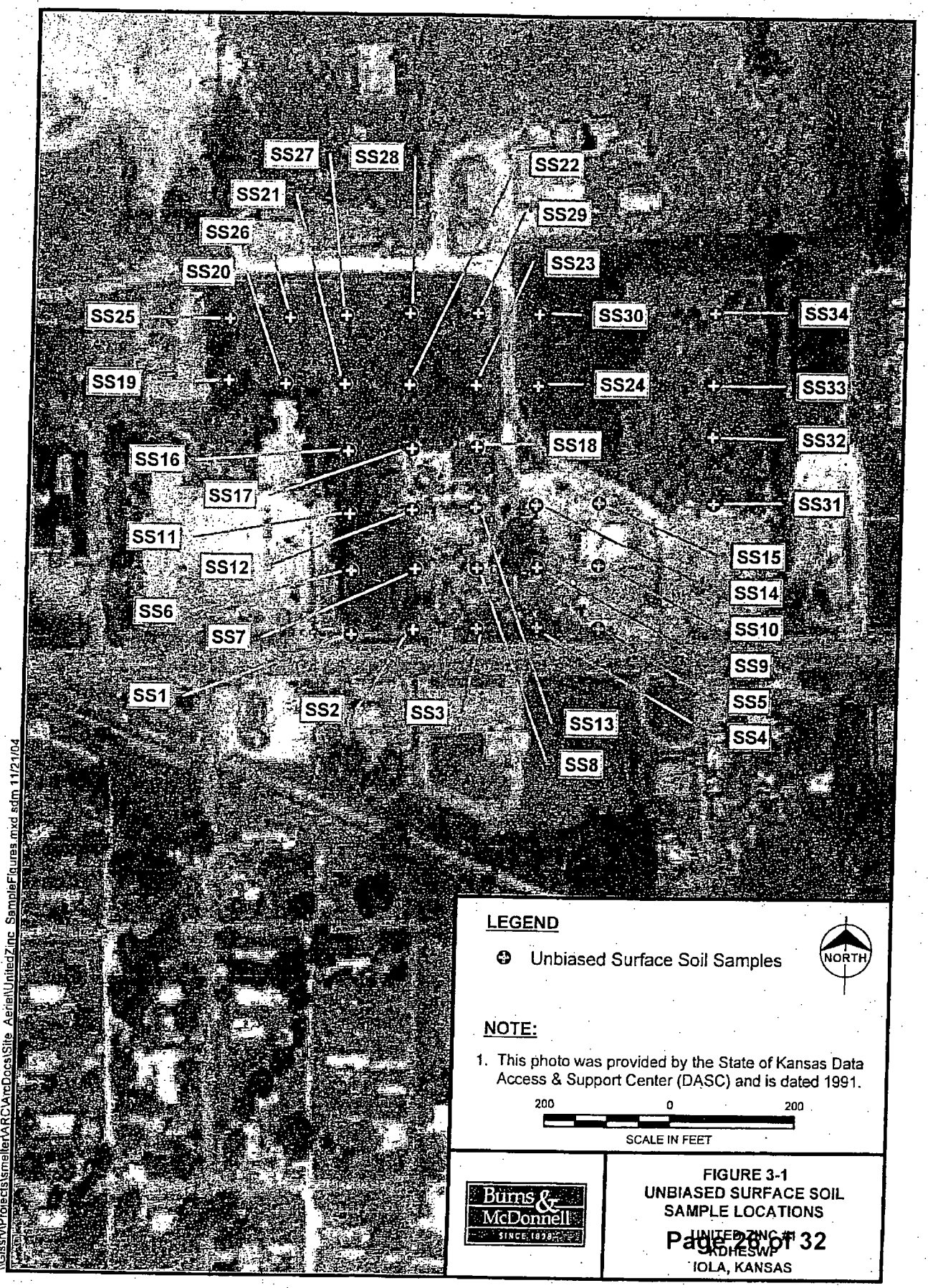
Taken from DeLorme, Kansas Atlas and Gazetteer, 1997.



Burns & McDonnell
SINCE 1898

Figure 1-1

REGIONAL MAP
FORMER UNITED ZINC #1
KDHESWP
IOLA, KANSAS


SS27
SS28
SS22
SS21
SS29
SS26
SS23
SS20
SS25
SS30
SS34
SS19
SS24
SS33
SS18
SS32
SS16
SS17
SS31
SS11
SS15
SS12
SS14
SS6
SS10
SS7
SS9
SS1
SS5
SS2
SS3
SS13
SS4
SS8
LEGEND
Unbiased Surface Soil Samples
NORTH
NOTE:
1. This photo was provided by the State of Kansas Data Access & Support Center (DASC) and is dated 1991.
200
0
200
SCALE IN FEET
Burns & McDonnell
SINCE 1898
FIGURE 3-1
UNBIASED SURFACE SOIL SAMPLE LOCATIONS
UNITED ZINC #1
KDHE SWP
IOLA, KANSAS
\\Glasrv\Projects\smelter\ARC\ArcDocs\Site_Aerial\UnitedZinc_SampleFigures.mxd sdm 11/21/04

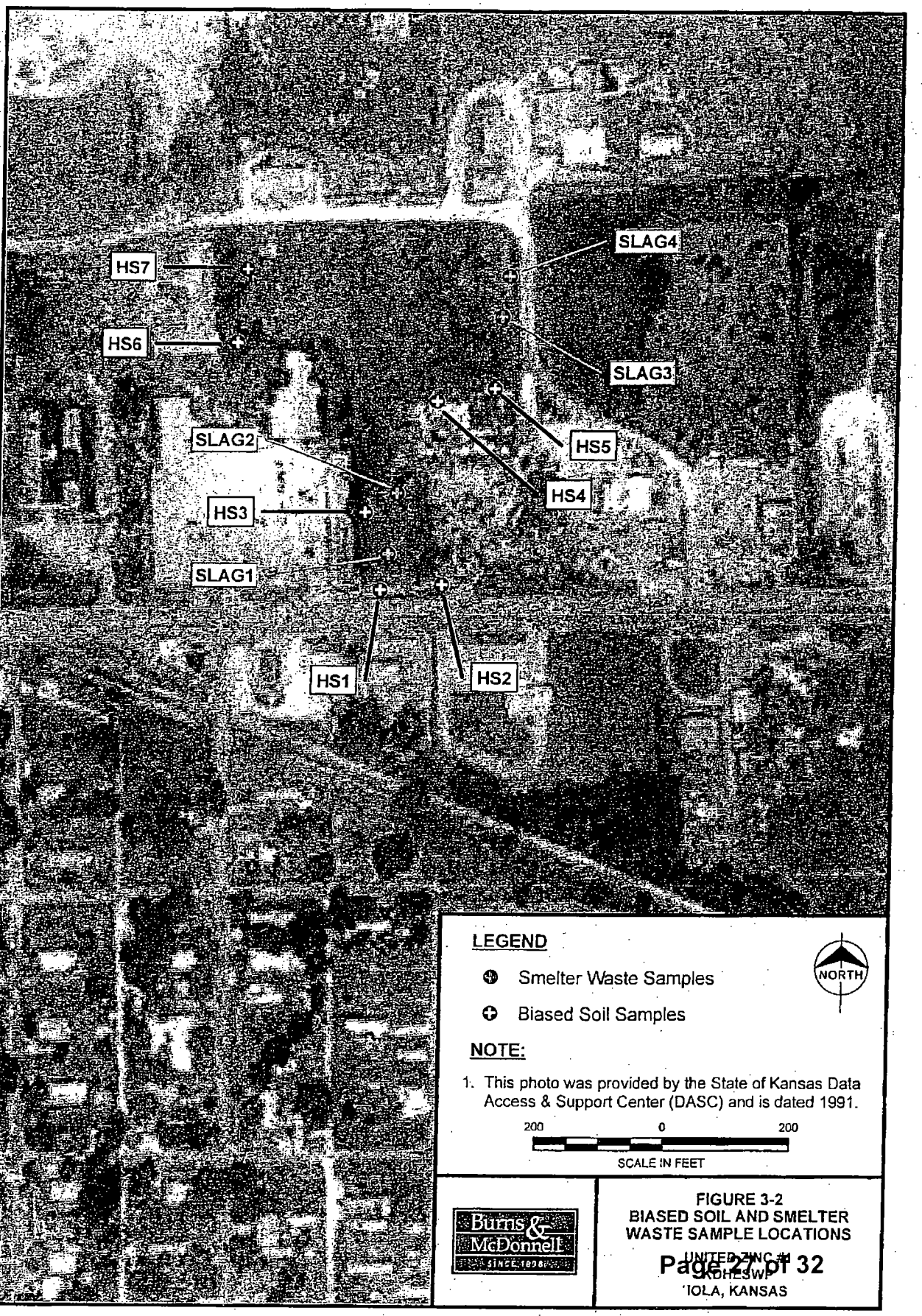


FIGURE 3-2
BIASED SOIL AND SMELTER WASTE SAMPLE LOCATIONS
UNITED ZINC #1
KDHESWP
IOLA, KANSAS

\\Gissrv\Projects\smelter\ARC\AreDocs\Site_Aerial\UnitedZinc_SampleFigures.mxd sdm 11/21/04

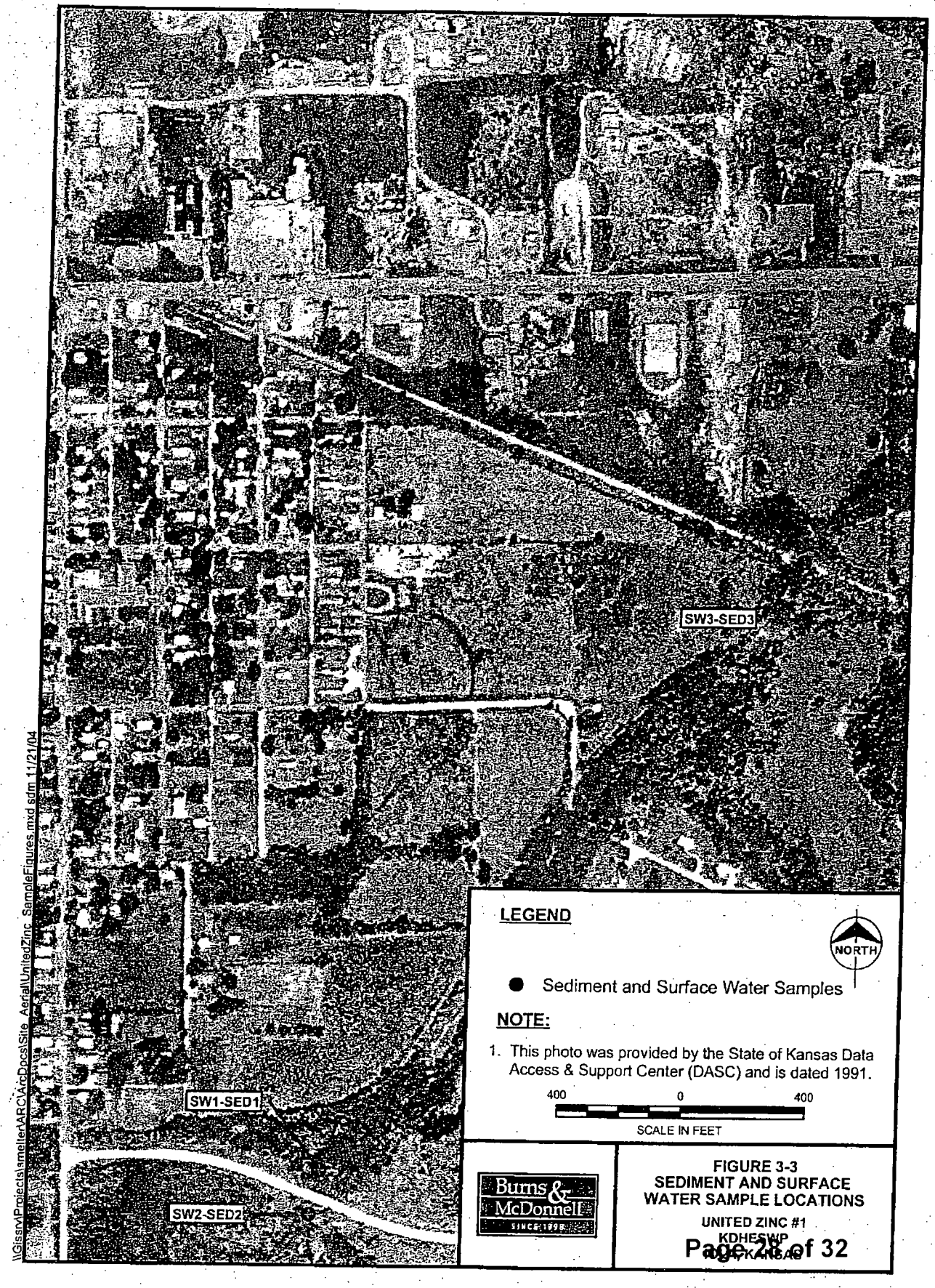
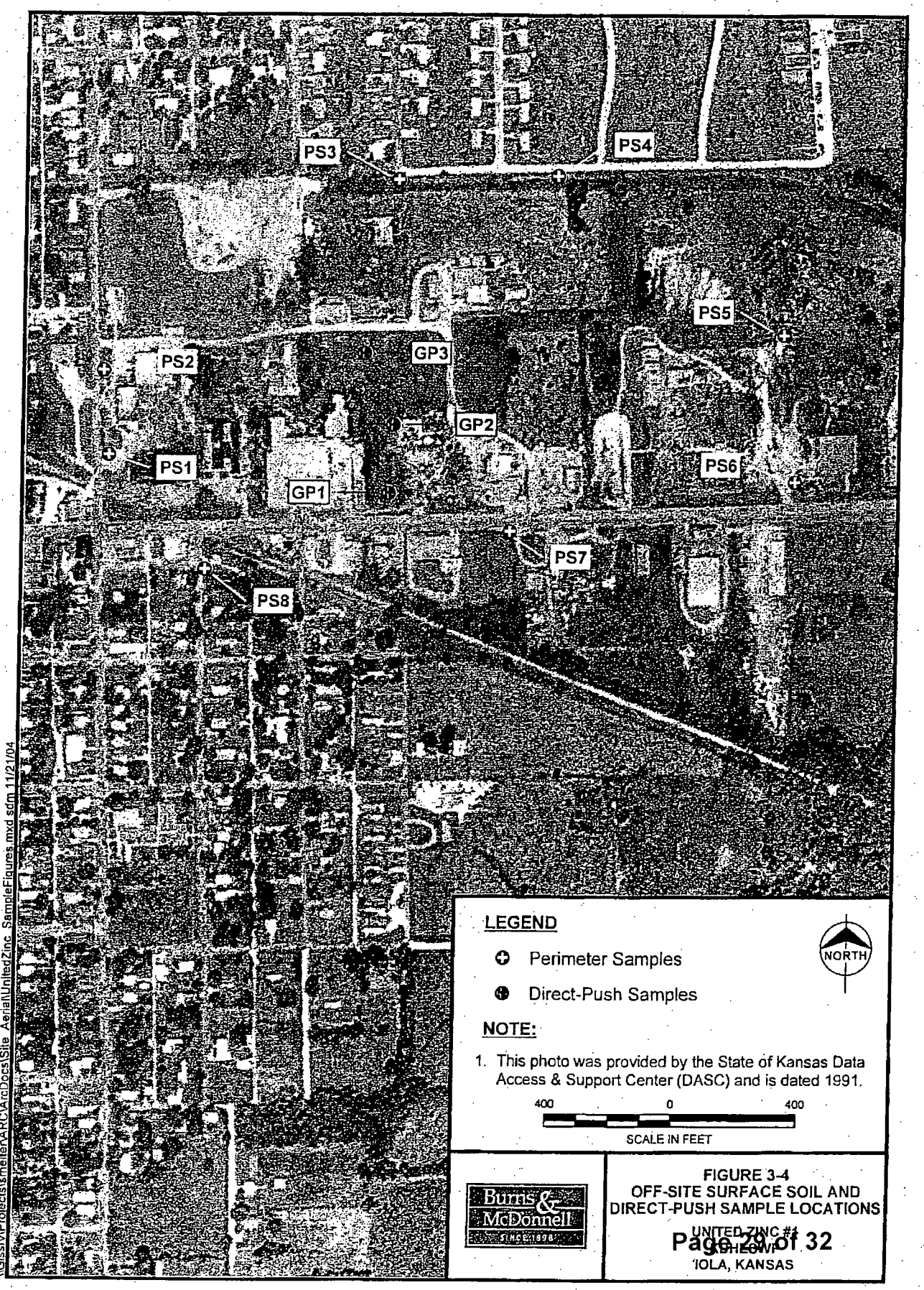
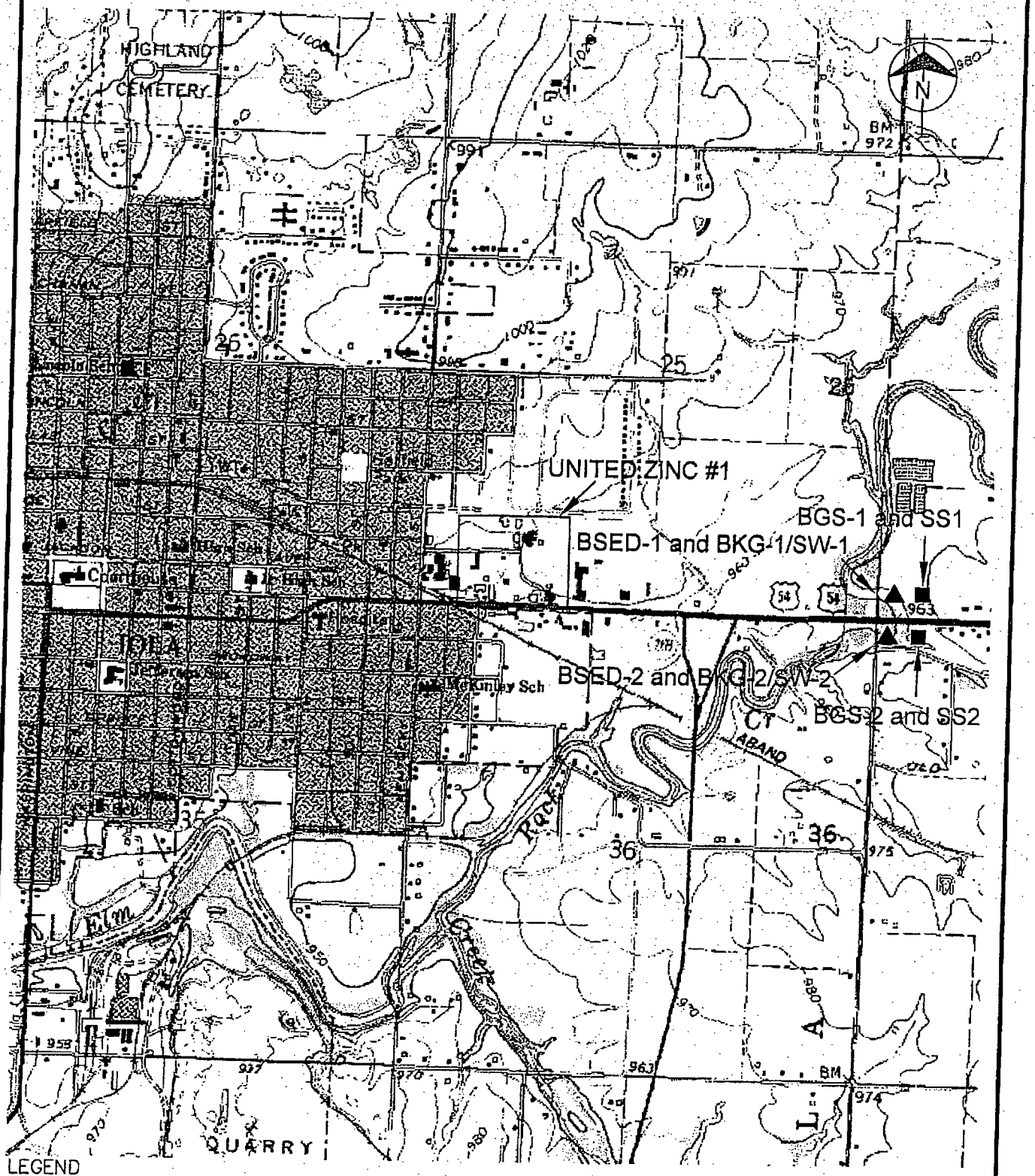


FIGURE 3-3
SEDIMENT AND SURFACE WATER SAMPLE LOCATIONS
UNITED ZINC #1
KDHE SWP
[illegible], KANSAS


PS3
PS4
PS5
PS2
GP3
GP2
PS1
GP1
PS6
PS7
PS8
LEGEND
Perimeter Samples
Direct-Push Samples
NORTH
NOTE:
1. This photo was provided by the State of Kansas Data Access & Support Center (DASC) and is dated 1991.
400
0
400
SCALE IN FEET
Burns & McDonnell
SINCE 1898
FIGURE 3-4
OFF-SITE SURFACE SOIL AND DIRECT-PUSH SAMPLE LOCATIONS
UNITED ZINC #1
IOLA, KANSAS
\\Gissrv\Projects\smelter\ARC\ArcDocs\Site_Aerial\UnitedZinc_SampleFigures.mxd sdm 11/21/04



▲ BACKGROUND SEDIMENT & SURFACE WATER SAMPLES

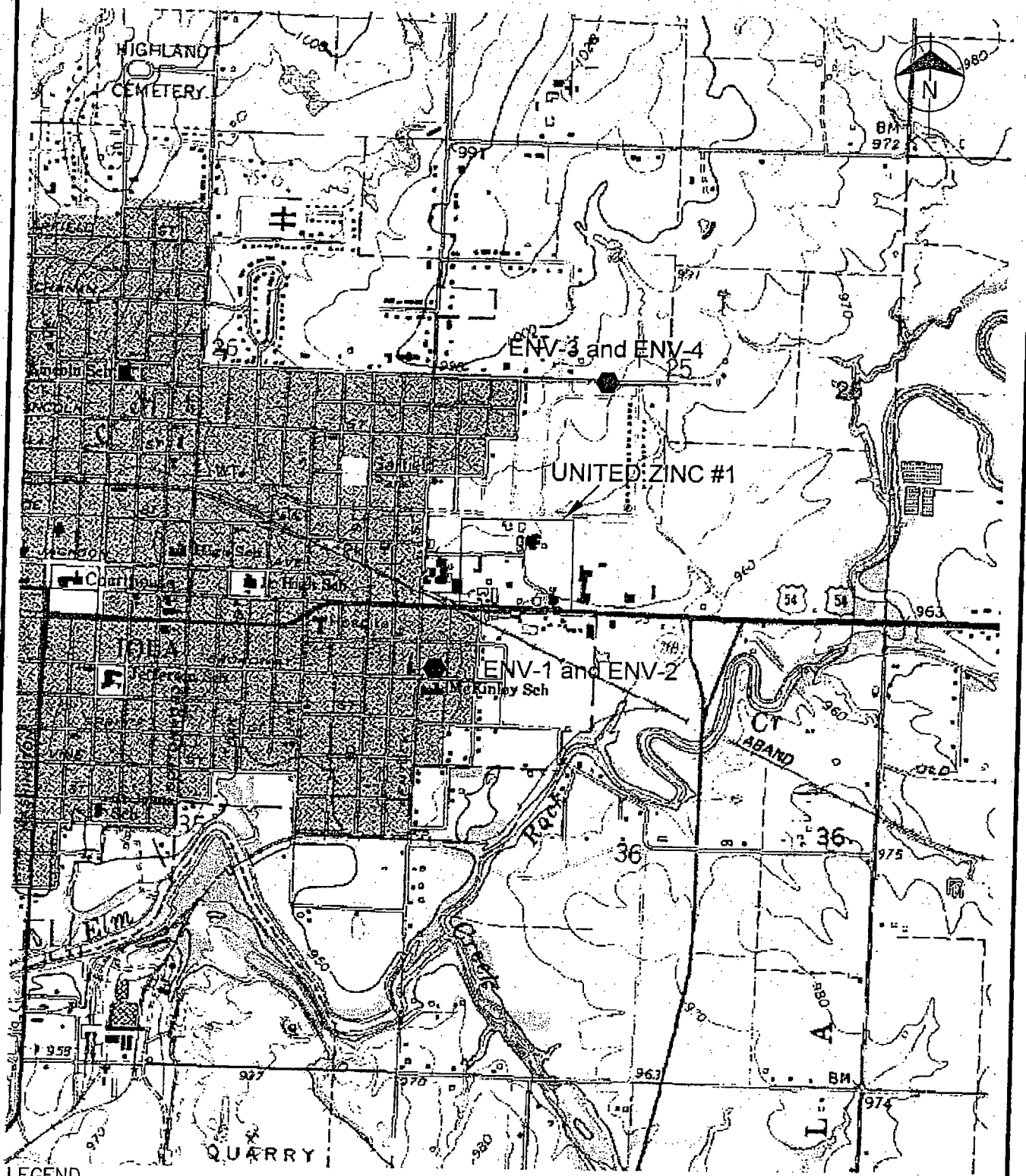
■ BACKGROUND SURFACE & SUBSURFACE SOIL SAMPLES

APPROXIMATE SCALE IN FEET
1600 0 1600 3200

Burns & McDonnell
SINCE 1898

Figure 3-5
BACKGROUND SAMPLE LOCATIONS
FORMER UNITED ZINC #1
KDHESWP
IOLA, KANSAS

K:\ENV\KDHE\SITE\35833\DELIVER\UNITED ZINC #1\PHASE II REPORT\QUADIOLA.DWG



LEGEND

SENSITIVE RECEPTOR SAMPLES

APPROXIMATE
1600 0 1600 3200
SCALE IN FEET

Burns & McDonnell
SINCE 1898

Figure 3-6
SENSITIVE RECEPTOR SAMPLE LOCATIONS
FORMER UNITED ZINC #1
KDHESWP
IOLA, KANSAS

Page 31 of 32

K:\ENV\KDHE\SITE\35833\DELIVER\UNITED ZINC #1\PHASE II REPORT\QUADIOLA.DWG

Tables

Kansas Department of Health and Environment

Bureau of Environmental Remediation/Remedial Section

Developed By: Aspen Junge and Rick Bean **December 28, 2006**

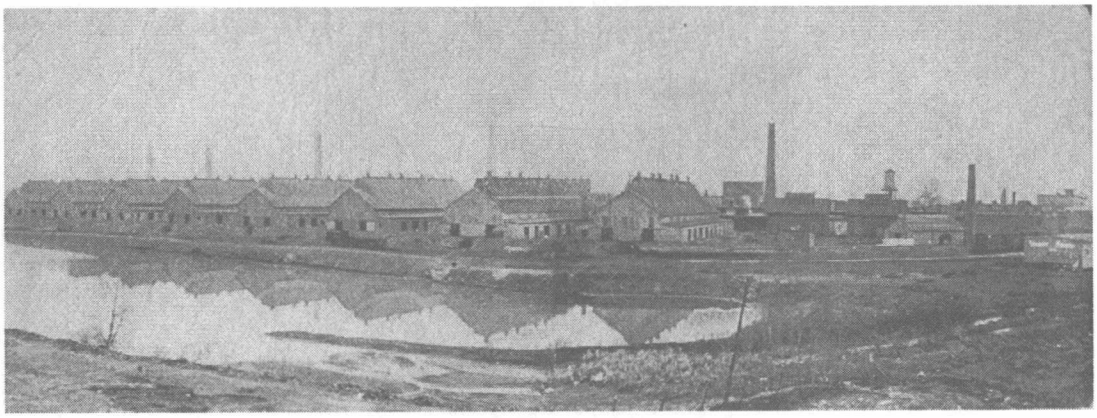
A Short History of the Zinc Smelting Industry in Kansas

The Industrial Age spawned in the late 1860's and spread prosperity westward across the nation. Portions of Kansas hoped to become an important part of this industrial movement. That hope was based on the availability of cheap fuel—coal, natural gas, and petroleum—found in great quantities from the 1860s onward. These fuels powered great factories producing glass, cement, building bricks and zinc. In southeastern Kansas, large areas of coal and zinc mining brought opportunity to thousands of workers. This area was part of the Tri-State Mining District. In the late 1870s the zinc smelting industry became an integral part of southeastern Kansas.

Zinc is a silvery metal which, combined with copper, is used to make brass. Modern pennies are made with a zinc core covered with a copper alloy. Zinc is used to galvanize steel, preventing it from rusting, and as a white pigment in paints. A hundred years ago, zinc was often used to make buckets, sinks, roofing shingles and gutters, and lids for canning jars (you can often find these in antique shops).

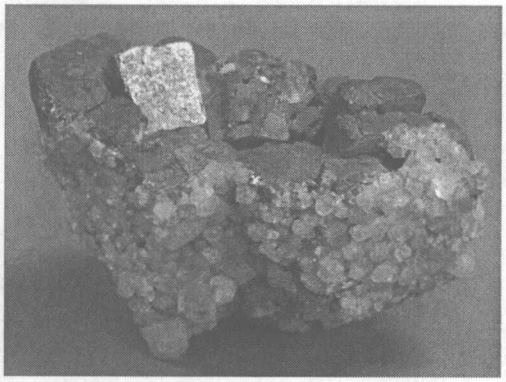
The Tri-State Mining District lies in southwestern Missouri, southeastern Kansas, and northeastern Oklahoma. For nearly fifty years, it was the world's richest producer of lead and zinc ores. More importantly, it was located next to the coal fields of southeastern Kansas. Coal was essential for smelting, the process of removing spelter—metallic zinc—from ore. The first zinc smelter in Kansas was built in Wier City in 1870.

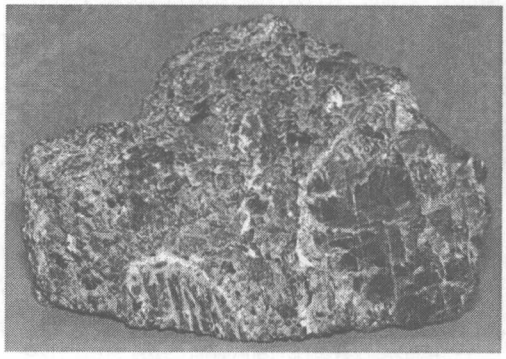
9



The Edgar Zinc Company in Cherryvale. This was the largest zinc smelter in Kansas. Photograph courtesy Kansas State Historical Society.

Right: A sample of galena, a type of lead ore found in the Tri-State Mining District.





Left: A sample of blackjack, a type of zinc ore found in the Tri-State Mining District.

Below: The Tri-State Mining District includes Cherokee County, Kansas; Ottawa County, Oklahoma; and Jasper and Newton Counties, Missouri. Many of the cities in this region were originally founded as mining camps.

Pittsburg Becomes a Smelting Center
Robert Lanyon was a British-born industrialist who operated a zinc smelter in LaSalle, Illinois. In 1877, he traveled to southeast Kansas to investigate the possibility of building another smelter in or near the Tri-State Mining District.

Lanyon quickly realized that Pittsburg was the ideal location for his new smelter. It was fewer than fifty miles from the richest zinc mines, and, more importantly, it was itself a coal-mining town. The local coal mining produced vast quantities of soft, or "slack" coal. Slack coal wasn't nearly as valuable as the harder coal found in deeper seams, and was stockpiled in favor of the higher-grade coal. The softer coal was, however, perfect for roasting and smelting zinc ore.

Robert Lanyon built a smelter at the southeast edge of town. Others soon followed; two, the S. H. Lanyon and Brother smelter built by Robert's brother and former business partner, and the W. & J. Lanyon smelter, built by his nephews William and Josiah, were located on the neighboring properties. Wier City Zinc Co. built the smelters north of Pittsburg (now 28th and North Broadway). The Pittsburg and St. Louis Zinc Co. built a plant to the east of town known locally as the East smelters (now on E. 20th St.), while the Granby Mining and Smelting Co. operated west of Broadway at 12th St.

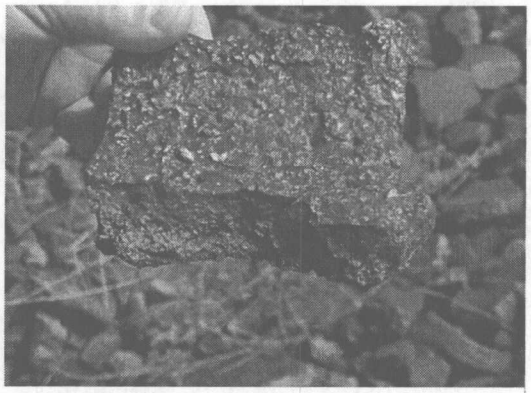
The Smelting Process
The primary zinc ore, and the one found in the Tri-State Mining District, is sphalerite, a lustrous cluster of tetrahedral crystals that are often dark reddish-brown or black, hence its nickname, "blackjack." It is also known by its German name, blende. Sphalerite is mostly zinc sulphide (ZnS), with impurities of iron, lead, cadmium, and antimony, and sometimes gold and silver. The sphalerite from the Tri-State Mining District is extremely pure, about 60% zinc by weight.

Ruins of the former Pittsburg and St. Louis Zinc Company smelters in Pittsburg.

It took about four tons of coal to smelt one ton of sphalerite, which is why it makes sense to build smelters nearer the coal mines than the zinc mines. Ore from the mines was shipped to the smelters by rail. The first step in the smelting process was to crush the ore into a powder, which was loaded into small metal carts and placed into the roasting kiln to be heated for 24 hours. Large fans constantly blew fresh air over the roasting ore, and gradually the sulfur in the ore would be replaced by oxygen. The ore had to be stirred every half hour, and until stirring machines were invented, workmen did this with long rakes. Temperatures in the buildings were so high that the workers would leave the doors open all winter, and would walk off the job if they weren't provided enough ice water in the summer.

The roasted ore, now zinc oxide (ZnO), was ground into a very fine powder, where it was mixed with powdered coke, coal that had been heated to drive off impurities until it was pure carbon. This mixture was pressed into bricks and loaded into retorts, clay cylinders about

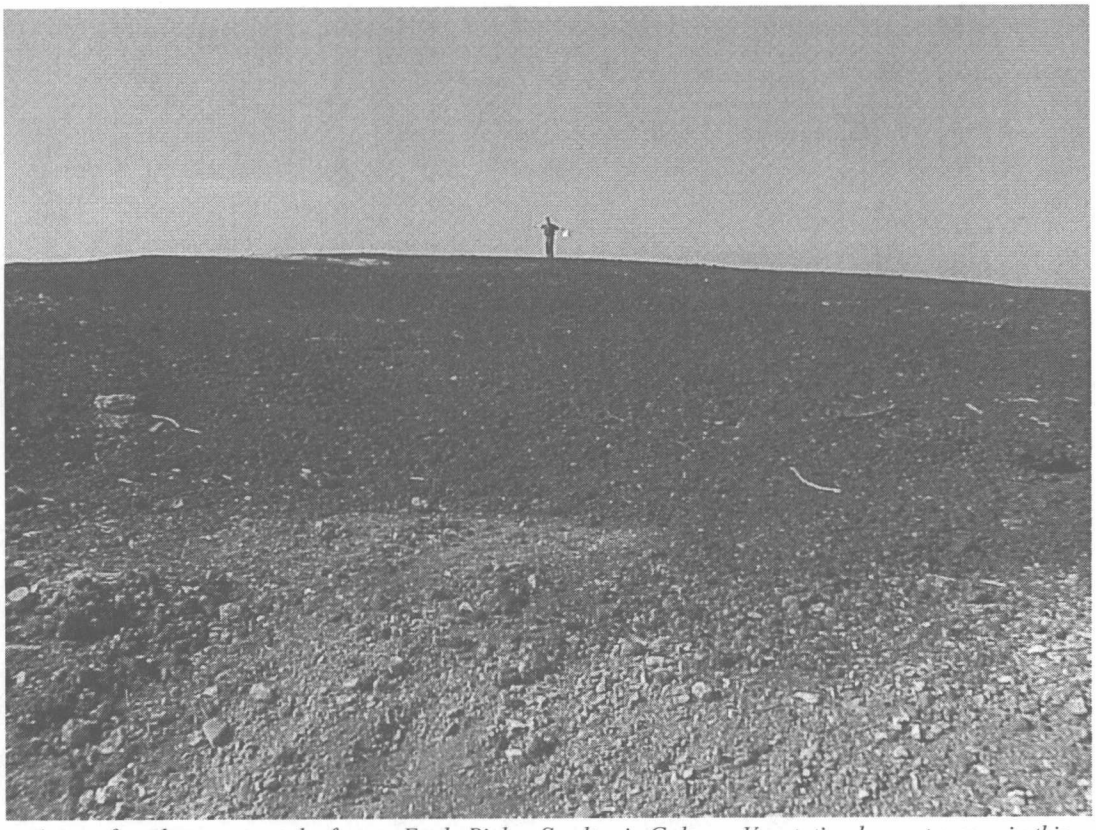
Broken retorts at the East La Harpe smelter. The extreme heat and minerals of the distilling furnaces cause the multiple colors on the surface of the retorts.



Ore residue after distilling.

10 inches in diameter and 8-10 feet long. The furnacemen would place a ceramic condenser on the open end of the retort and glue it in place with a dab of wet clay. Then they'd load the retorts into racks built into the furnace with the condenser end sticking out and slightly elevated.

The retorts would be heated for several hours, and the coke/ore mixture inside went through a chemical transformation. As the temperature in the retort approached 1975°C, the mixture would vaporize and the oxygen in the ore would combine with the carbon in the coke to form carbon oxides (CO and CO_2). The metallic zinc left behind would vaporize, move into the condenser, and condense into liquid zinc. Two or three times a day, the furnacemen would break the clay plug on the condenser and pour, or "draw", the molten zinc into giant ladles, then cool the zinc in molds holding 50 pounds of metal. After 24 hours, the charge in the retort would be exhausted and the furnacemen would pull the hot retort out of the furnace, clean out the slag with a blast of steam, and recharge it with a fresh mixture of coke and roasted ore. Smelters ran 24 hours a day, seven days a week.



Acres of smelter waste at the former Eagle Picher Smelter in Galena. Vegetation has not grown in this area for 100 years because of high levels of heavy metal contamination.

The furnaces were amazing sights—racks of hundreds of retorts, each with a multi-colored flame coming out of the end. Furnacemen could determine the temperature and purity of the ore by the flames' colors.

Smelting Operations Were Not Only Dangerous But Also Caused Massive Amounts of Pollution.

Burning coal releases sulfur and nitrogen oxides, which irritate the eyes and lungs and create acid rain. Also, burning 28 tons of coal a day created incredible amounts of soot to blacken the skies and cover items left outside with black soot. This soot was generally contaminated with elevated levels of lead, cadmium, arsenic, and zinc. Roasting the ore also put an incredible amount of additional sulfur dioxide into the atmosphere. Some smelters, like the United Zinc and Chemical Company plant located in Iola, were designed to capture these fumes and make sulfuric acid. It was possible to put a primitive cloth or paper filter in each smoke stack, but the most common way to handle air pollution was to raise the height of the stack so the smoke would catch higher breezes and disperse over a larger area. Farmers living downwind of the smelters saw their crops wither from the fumes, and some sued for damages.

In addition to airborne pollution, the smelting operation left large volumes of solid waste. This waste consisted of cinders from coal-fired furnaces, broken retorts, building materials removed

during repairs, impure smelting slag, and the slag blown from the retorts at the end of the smelting process. These materials are likely contaminated with sulfur and heavy metals like lead, cadmium, arsenic, and germanium. Some of the waste material was reprocessed for its iron, gold, silver, or copper content or used as construction fill or ballast on railroad lines. Most of the waste was left after the smelter closed for future generations to address. The former Eagle-Picher Smelter located in Galena has approximately 60 acres of waste, some of which is 15 feet deep.

During World War II, some of the waste piles in Iola were taken away to be re-smelted using more efficient processes. As waste slag erodes into dust, the contaminants become mobile and can be wind-blown or wash into surface waters.

A slag pile located south of Gas, Kansas.

Smelters were extremely dangerous places to work. This was before industrial safety standards and crippling accidents to workers were common. Workers could be crushed by ore cars, kicked by a horse or mule, or have their clothing caught in fast-moving machinery, resulting in horrific injuries. A few drops of water in a ladle or mold would, when used to draw zinc, immediately flash into steam, spattering drops of molten metal all over the unlucky furnaceman. At the time, there was almost no disability or workman's compensation insurance. To work in a smelter, or almost any other factory, was to risk your life and health for nothing more than your take home pay, which in 1902 was from 12 to 20 cents per hour.

Consolidation Of The Smelting Industry.

Most of the early zinc smelters were owned and operated by entrepreneurs, who raised capital locally and ran the plants themselves. They purchased both coal and zinc ore directly from mines that were similarly run as small to medium-sized enterprises. In 1895-1896, a few industrialists in St. Louis decided that a consolidation of smelting interests would stabilize prices and lead to a more profitable market. Led by James J. McDonald, the Cherokee-Lanyon Spelter Co. purchased or leased almost every coal-fired zinc smelter west of the Mississippi River (the single holdout was the W & J Lanyon smelter in Pittsburg).

Unfortunately for Cherokee-Lanyon, it was never able to completely dominate the Tri-State Mining District zinc industry because of some new and interesting developments just to the north and west, in Allen County.

Opening the Gas Fields – New Opportunities

In 1895 there were coal-fired smelters operating in Pittsburg, Girard, Wier City, Scammon, and Argentine. There was also an interesting discovery being made in Allen County, slightly to the north and west of the Kansas coal region. Drillers had discovered a pocket of underground natural gas that could produce tens of

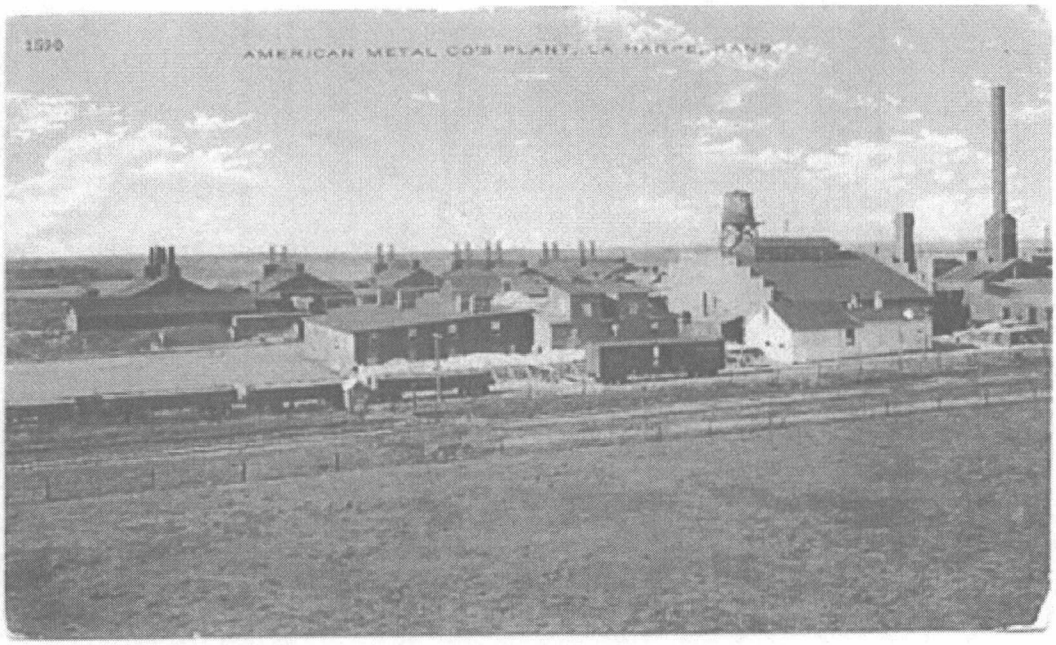
thousands of cubic feet of gas per day from a single well. The citizens of Allen County thought the supply of gas was inexhaustible, and offered free fuel to any manufacturer who would locate in the county. They especially appealed to zinc smelters.

The people thought there would be no end to the gas, and didn't even try to conserve it. Free gas was piped to every home in the county seat of Iola. Street lamps were left burning all day, and those with gas stoves would open windows in the winter rather than turn down the heat.

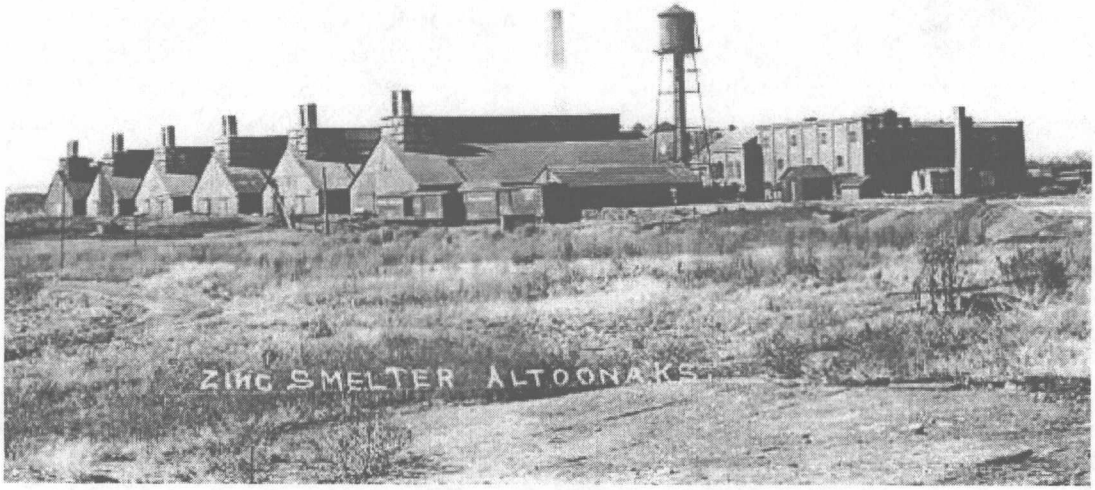
Robert Lanyon sold his Pittsburg smelter to Cherokee-Lanyon and built a new one in Iola. Unfortunately, the furnaces were not well designed for gas-fired smelting, and the new plant wasn't successful until new furnaces were designed and built. Once the new furnace designs proved successful, smelting companies flocked to the gas belt.

Iola, and its neighboring cities of La Harpe and Gas, was the biggest beneficiary of the smelter boom. By 1903, Allen County had eight smelters (one equipped for making sulfuric acid from the roasting fumes) and a rolling mill for turning pig zinc into sheets to use as gutters, shingles, and so forth. There were also gas-fired smelters operating in or planned for Altoona, Chanute, Caney, and Cherryvale.

Gas was plentiful, and provided to the smelters very cheaply or for free. The coal-fired smelters couldn't produce spelter cheaply enough to compete, and in 1900 all coal-fired smelters in Pittsburg, Bruce, Wier City, Girard, and Cherokee were closed. Cherokee-Lanyon built two smelters in the gas belt in order to stay in business. Other industries flocked to the gas belt, and Kansas became a producer of glass, bricks, and portland cement as well as zinc.



The American Metals plant in La Harpe.



The Altoona smelter operated between 1903 and 1917.

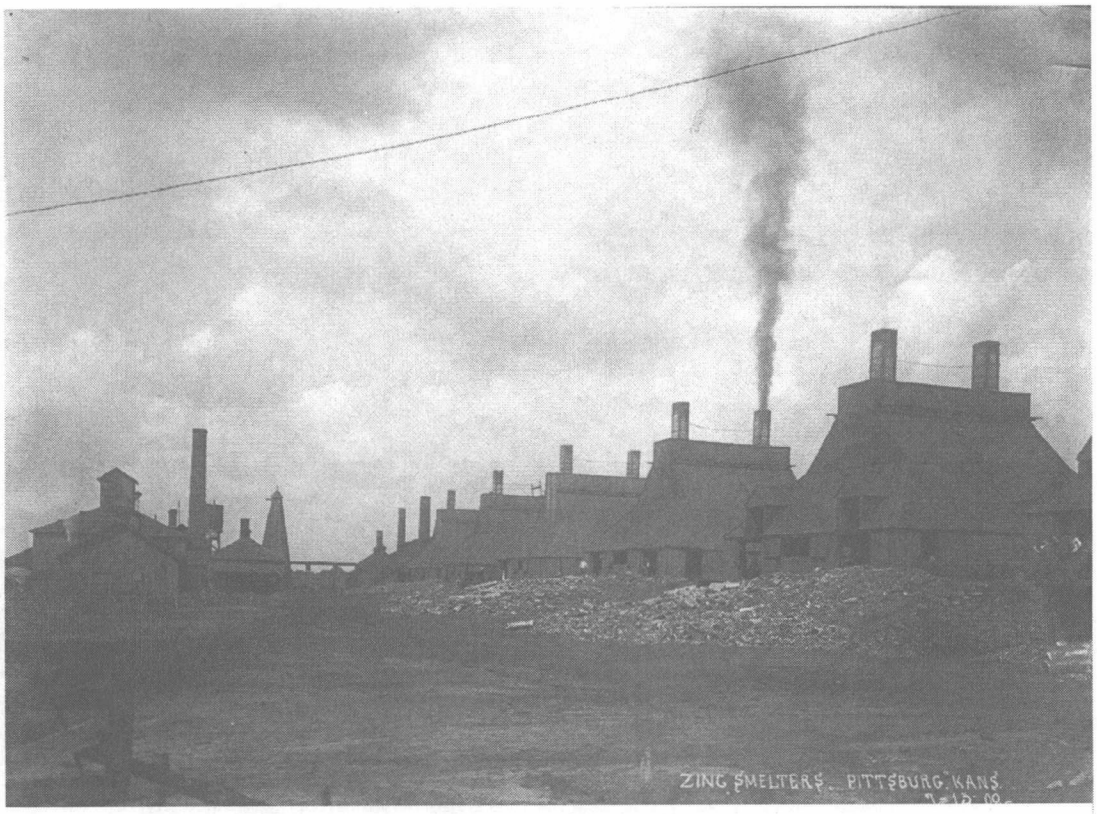
The same smelter in 2005-- acres of smelter waste with little or no vegetation.

The Return to Coal

Gas was so cheap that nobody saw any reason to conserve it, and the furnaces had very inefficient designs. Eventually there was a decline in gas production. Factories and towns began drilling for gas further from their industrial centers. Within a few years, the gas pressure was so poor the pipeline companies had to install pumps, and on very cold days the pressure would drop to the point where a smelter could not fire their furnaces until the weather warmed up.

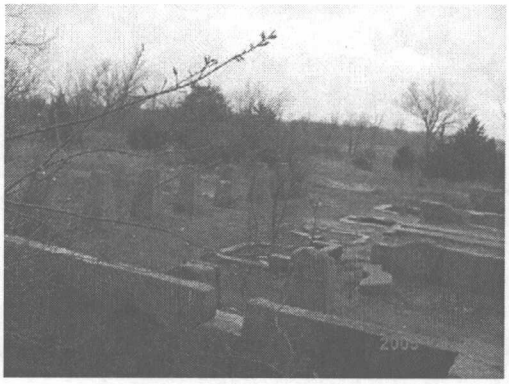
On the other hand, market prices for zinc were good enough from 1904-1907 that many of the coal-fired smelters were reopened. The original Robert Lanyon plant in Pittsburg had been torn down, but the East and North works were reopened by Lanyon Zinc Co. and Cockerill Zinc Co. Cockerill Zinc Co. also operated smelters in Altoona, Bruce (just west of Cherokee), Gas, Iola, and La Harpe, making Cockerill Zinc Co. one of the largest producers. New smelters were built in Dearing and Caney.

In order to compensate for the higher price and lower availability of gas, some smelters began shipping more and more of their ore by rail from Colorado. Most of the Colorado ore was blende, the same as found in the Tri-State Mining District, but an increasing amount was in the form of calamine. Calamine contains relatively little elemental zinc, compared to blende, but the zinc is already in the form of zinc oxide and



Cockerill Zinc Co. operated Pittsburg's North smelters in 1905.
Photograph courtesy Kansas State Historical Society.

thus does not require roasting before distilling. Ore in the form of zinc oxide would save smelter operations a great deal of fuel. The Cherryvale smelter turned to petroleum to fire its roasting kilns.



Smelter foundations in La Harpe.

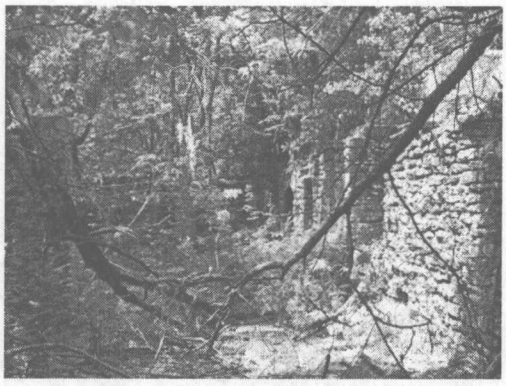
Syndicates Collapse

The year 1910 saw a great many of the Kansas smelters close. Cockerill Zinc Co. went bankrupt, its assets seized and sold to pay its debts. Lanyon Zinc Co., with three smelters in Allen County and one at Pittsburg, went into receivership and closed its plants. Even the Cherokee-Lanyon Spelter Co., the first of the syndicates, was gone, having sold or leased its properties to other operators. On the other hand, smelters were being built in Oklahoma, where sufficient gas was easily found. Faced with competition from smelters in Oklahoma, Colorado, Illinois, and West Virginia, the Kansas zinc industry did poorly for the next few years.

The War Years

The zinc smelting industry in Kansas did not do well between 1911 and 1914. The war years sparked the last great smelting boom in Kansas. Supplies of spelter from Europe were cut off at a time when more zinc was needed for domestic use and for building munitions. Even so, the vast increase in demand took the industry by surprise.

In Pittsburg, the old East and North works were repaired and reopened, the East works by Pittsburg Zinc Co. and the North works by the Joplin Ore and Spelter Co., a consortium formed by zinc mining companies in the Tri-State Mining District. When spelter prices shot up, both companies rushed to get their plants into production. Pittsburg Zinc Co. even considered repairing and reopening the old W & J Lanyon works, but residents in the neighborhood, concerned about pollution, persuaded them not to. Many of the older smelters in Iola, Altoona, Gas, La Harpe, Neodesha, Cherryvale, Bruce, Chanute, Caney, and Dearing suddenly had all the business they wanted and operated at full capacity. The American Spelter Co. built a new plant at Pittsburg, and the Iola Zinc Co. temporarily converted an abandoned portland cement factory into a smelter at Concreto, just north of Gas.



The ruins of the Iola Zinc Company smelter at Concreto, once a portland cement plant.

As the war was drawing to a close, prices of zinc dropped back to their pre-war levels. Profits also plummeted, and most of the Kansas plants closed. By

1921, only two smelters remained in operation: Edgar Zinc Co. in Cherryvale and Weir Smelting Co. in Caney. These two plants managed to hang on for another ten years, until competition from the new electrolytic smelting methods and the Depression closed the Caney plant for good in 1931. The Cherryvale plant continued operating on a small scale, reprocessing smelter wastes, until 1976.

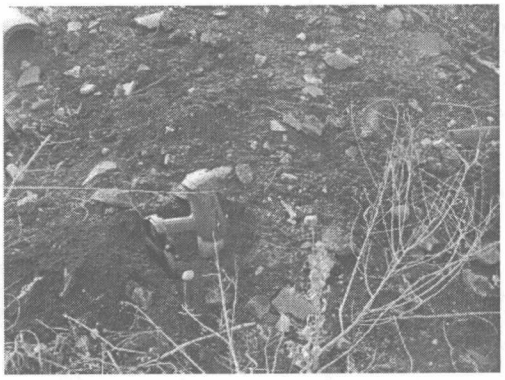
The Smelters Today

Little is left to be seen of the zinc industry in Kansas today. A visit to a former smelter site may show a quiet lot or empty field, a few foundations peeking through the underbrush, piles of broken bricks or ceramic retorts and acres of contaminated smelter waste (slag), soil, sediments and surface water.

KDHE is working with the EPA, local communities, landowners, residents, and developers to locate these former smelter sites, assess the environmental damage and risk to human health, and clean them up. Looking at the historical records, such as historical monographs, newspaper stories, land title records, aerial photographs, and historical deeds can identify these former smelter operations. KDHE staff also interviews people living in the area in order to gather valuable information. To date, KDHE has identified a total of 33 former smelter operations in Kansas.

Ruins of a kiln at the North smelter in Pittsburg.

A majority of the smelters operated in the southeast part of the state with the exception of the Argentine smelter located in Kansas City. Almost all of the former smelter properties are abandoned and are not in productive use. Most still have remnants of the smelter and acres of barren, non-vegetated land.

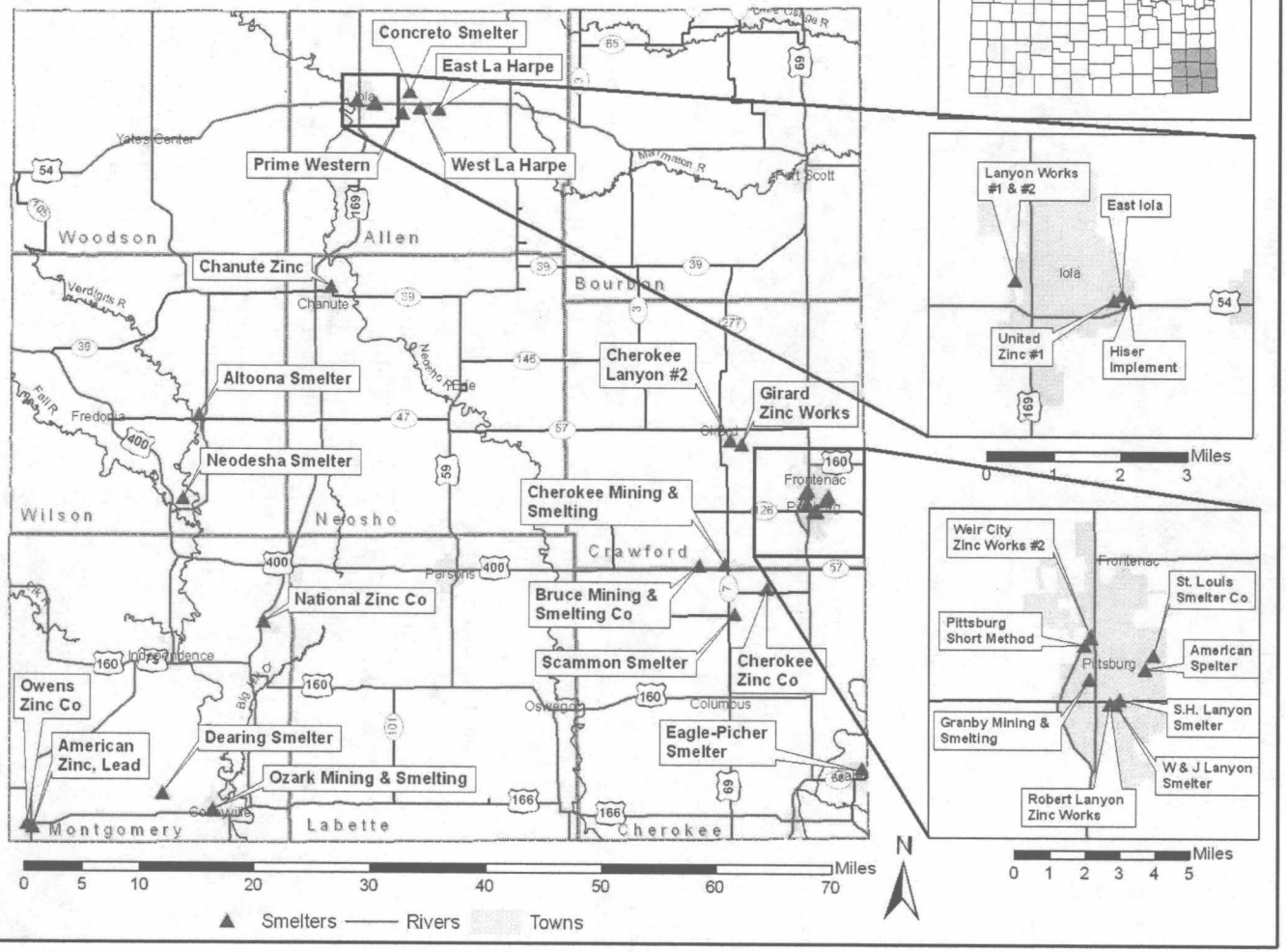


An XRF analyzer used for field screening.

Restoring the Environment and Promoting Property Redevelopment

Addressing environmental contamination caused by former smelter operations can be very expensive and time consuming. Once a site is identified, KDHE contacts the landowner and gets permission to begin an initial assessment of the identified property. The assessment includes a visit to the site to evaluate environmental conditions, photograph the site, review the site's history, and identify potential human and environmental receptors and population demographics for that area. This information is used by KDHE to develop a sampling plan.

Smelter Locations in Southeast Kansas



Before and after pictures of a successful cleanup and redevelopment project in east Iola. The smelter waste, lead, and contaminated soil was consolidated into one small area and capped, and now lies underneath this parking lot. Consolidation and capping is an effective and relatively inexpensive remedial method, and land use restrictions prevent digging on the property or its use as a residence.

Fish and sediment sampling downstream of the Cherryvale smelter in order to identify the impact of contamination on surface waters.

A sampling assessment includes collecting environmental samples from soil, sediment, surface water, and ground water in order to determine the presence, source, and movement of environmental contamination. The assessment also identifies various human health receptors such as schools, residential yards, and domestic wells, and environmental receptors such as streams, wetlands, parks, and ponds. Test results for substances such as lead, zinc, cadmium, and arsenic are compared to the health standards outlined in KDHE's Risk-based Standards for Kansas (RSK) manual. KDHE uses this information to assign a priority to the project and determine how to proceed with further analysis.

At the same time as the sampling assessment, KDHE investigates the business history of the facility in order to determine if any of the corporations that operated at the smelter have successors that still exist today and are legally liable for the costs associated with cleanup of the facility. If a financially viable corporation is found, KDHE contacts them and brings them into the cleanup planning and execution process through an agreement with a state response program. If there is no successor corporation, the site is declared an orphan and funds for cleanup come from a state or federal program. Generally state orphan site money is very limited.

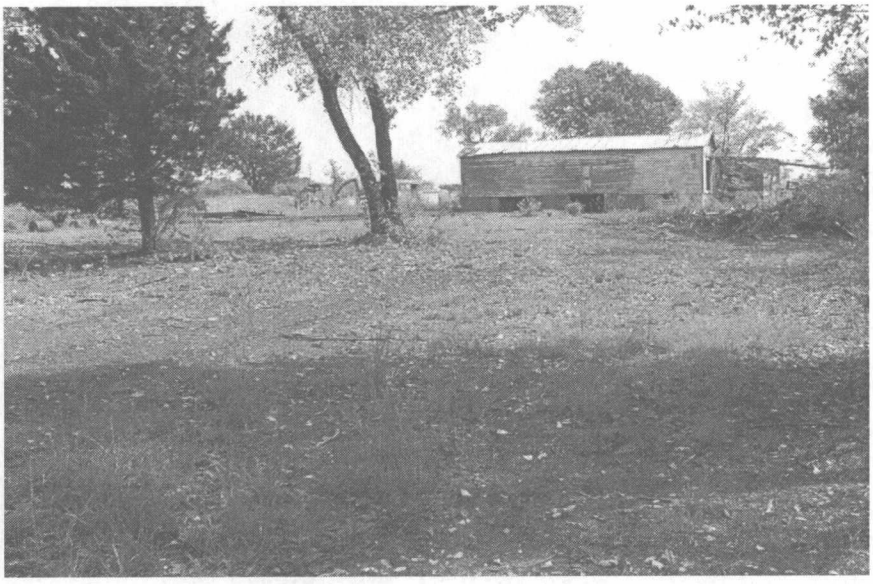
Cleanup activities are determined by a variety of factors including the type of contamination, the volume and extent of

Removal of contaminated soil from a school yard in Iola.

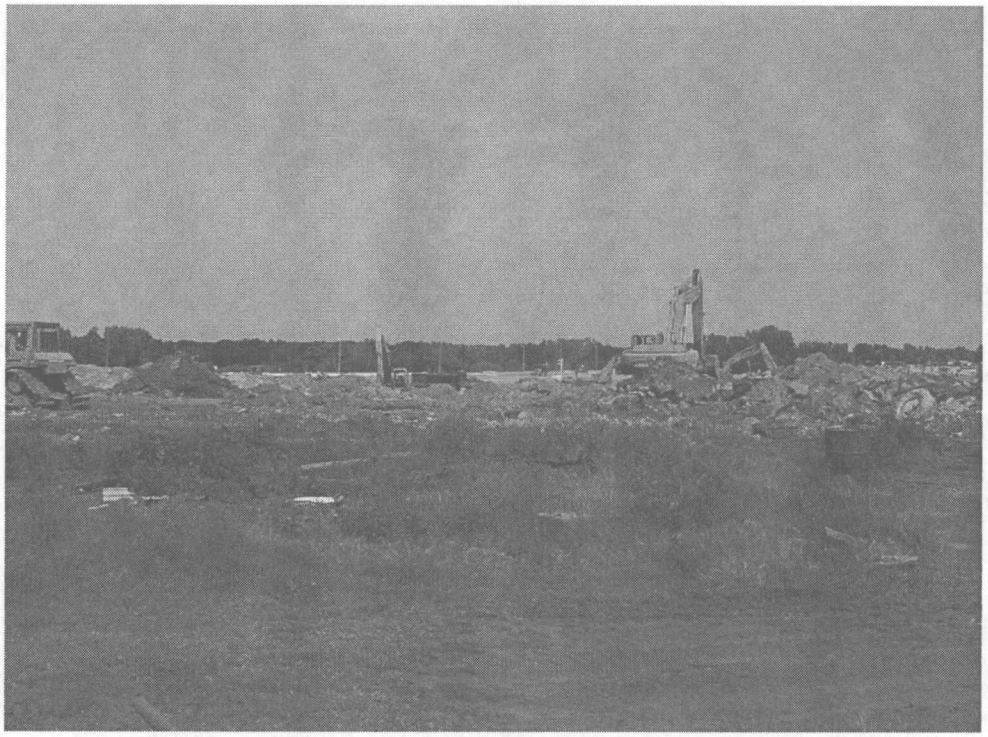
contamination present, the number of human health and environmental receptors impacted, the cost of various cleanup options, and the future land use for the property following cleanup. A common cleanup alternative for contaminated smelter sites is to consolidate the waste into a small area and encapsulate the waste by constructing an engineered cap over the waste. Engineered caps can consist of asphalt, clay, concrete or some other impermeable material.

The capped area may be redeveloped into commercial or industrial parking lots, streets, and building foundations. The advantages of consolidation and capping are that it is relatively inexpensive, is effective as the contaminated material is controlled through engineering and environmental use controls, and the contamination can be monitored. This solution also means the contamination does not have to be transported off-site to a landfill or other area. Areas that have been capped can be redeveloped into commercial or industrial properties.

The fifty years of zinc smelting in Kansas brought opportunity to thousands of workers and encouraged the development of new communities. The prosperity of the era also left behind a legacy of contaminated land that has resulted in millions of dollars of private and public funding to complete environmental cleanup ensuring the protection of human health and the environment.



Abandoned smelter waste and contaminated soil at Former Weir City Zinc Smelter.



Above: Remediation activities at the Weir City Zinc Smelter site.

Below: Cleanup of the Weir City Zinc Smelter site is completed. Following cleanup, the once contaminated property is successfully redeveloped into a viable commercial business and the community's economy is revitalized.

http://www.epa.gov/enviro/html/multisystem.html
Last updated on Wednesday, February 20th, 2008.

Envirofacts Multisystem

You are here: EPA Home Envirofacts Multisystem Query

Multisystem Query

The Envirofacts Query Form allows you to search multiple environmental databases for facility information, including toxic chemical releases, water discharge permit compliance, hazardous waste handling processes, Superfund status, and air emission estimates. Search the Envirofacts database using any combination of the following criteria: facility name, geography, or Standard Industrial Classification (SIC) Code. A query returns a list of facilities that match the criteria entered. An individual site report can be retrieved by clicking on that facility name.

User's Guide

Facility Selection

Facility Site Name:

◉ Beginning With ○ Exact Match ○ Containing

Geography Search

Enter a partial value for any geography option except for the state value. We strongly recommend that you enter a small geographical area to begin the search since Envirofacts contains a large number of facilities.

10

ZIP Code:

Address:

◉ Beginning With ○ Exact Match ○ Containing

City: Iola

County: Allen

State: KS

EPA Region: 7

Standard Industrial Classification Search

Enter the Standard Industrial Classification or lookup the appropriate SIC code by pressing the "Lookup SIC Code" button. If both SIC Code and SIC Code Description are entered, only SIC Code will be used in the search. A partial string may be entered for the SIC Code Description.

Standard Industrial Classification Code: Lookup SIC Code

Standard Industrial Classification (SIC) Description:

Pollutant Search

Enter the name of a pollutant or a CAS Number. If both a name and CAS Number are entered, only CAS Number will be used in the search. This search will only be performed against TRIS, PCS, and AIRS/AFS facilities at this time.

Note: Searching using either a pollutant name or CAS number results in a slower than normal search.

Pollutant Name: Lead

◉ Beginning With ○ Exact Match ○ Containing

Chemical Abstract Service (CAS) Number: Lookup Pollutant codes and CAS numbers.

Search Clear

Envirofacts Data Warehouse

Last Updated on Friday, March 28th, 2008.

You are here: EPA Home Envirofacts Multisystem Query Results

Query Results

Report an Error

City Name: Iola
County Name: Allen
State Abbreviation: KS
EPA Region Code: 7
Chemical Name: Beginning With: Lead

LIST OF EPA-REGULATED FACILITIES IN ENVIROFACTS

To see a report on a facility click on the underlined Facility Name. Click on the underlined "View Facility Information" link to view EPA Facility information for the facility.

Go To Bottom Of The Page

FACILITY NAME/ADDRESS	FACILITY INFORMATION	Permitted Discharges to Water?	Toxic Releases Reported?	Hazardous Waste Handler?	Active or Archived Superfund Report?	Air Release Reporte
GATES CORPORATION 1450 MONTANA ROAD IOLA, KS 66749	View Facility Information	NO	**YES**	**YES**	NO	**YES**
IOLA WASTEWATER PLANT P.O. BOX 308 IOLA, KS 66749	View Facility Information	**YES**	NO	NO	NO	NO

Go To Top Of The Page

Total Number of Facilities Displayed: 2

http://www.epa.gov/enviro/html/multisystem.html
Last updated on Wednesday, February 20th, 2008.

Envirofacts Multisystem

You are here: EPA Home Envirofacts Multisystem Query

Multisystem Query

The Envirofacts Query Form allows you to search multiple environmental databases for facility information, including toxic chemical releases, water discharge permit compliance, hazardous waste handling processes, Superfund status, and air emission estimates. Search the Envirofacts database using any combination of the following criteria: facility name, geography, or Standard Industrial Classification (SIC) Code. A query returns a list of facilities that match the criteria entered. An individual site report can be retrieved by clicking on that facility name.

User's Guide

Facility Selection

Facility Site Name:

◉ Beginning With ○ Exact Match ○ Containing

Geography Search

Enter a partial value for any geography option except for the state value. We strongly recommend that you enter a small geographical area to begin the search since Envirofacts contains a large number of facilities.

ZIP Code:

Address:

◉ Beginning With ○ Exact Match ○ Containing

City: Iola

County: Allen

State: KS

EPA Region: 7

Standard Industrial Classification Search

Enter the Standard Industrial Classification or lookup the appropriate SIC code by pressing the "Lookup SIC Code" button. If both SIC Code and SIC Code Description are entered, only SIC Code will be used in the search. A partial string may be entered for the SIC Code Description.

Standard Industrial Classification Code: Lookup SIC Code

Standard Industrial Classification (SIC) Description:

Pollutant Search

Enter the name of a pollutant or a CAS Number. If both a name and CAS Number are entered, only CAS Number will be used in the search. This search will only be performed against TRIS, PCS, and AIRS/AFS facilities at this time.

Note: Searching using either a pollutant name or CAS number results in a slower than normal search.

Pollutant Name: arsenic

◉ Beginning With ○ Exact Match ○ Containing

Chemical Abstract Service (CAS) Number: Lookup Pollutant codes and CAS numbers.

Search Clear

Beginning+With&cas_num=&page_no=1&output_sql_switch=FALSE&report=1&database_type=ENVIROFACTS

Last updated on Friday, March 28th, 2008.

Envirofacts Data Warehouse

You are here: EPA Home Envirofacts Multisystem Query Results

Query Results

Report an Error

City Name: Iola
County Name: Allen
State Abbreviation: KS
EPA Region Code: 7
Chemical Name: Beginning With: arsenic

LIST OF EPA-REGULATED FACILITIES IN ENVIROFACTS

To see a report on a facility click on the underlined Facility Name. Click on the underlined "View Facility Information" link to view EPA Facility information for the facility.

Go To Bottom Of The Page

FACILITY NAME/ADDRESS	FACILITY INFORMATION	Permitted Discharges to Water?	Toxic Releases Reported?	Hazardous Waste Handler?	Active or Archived Superfund Report?	Air Release Reporte
IOLA WASTEWATER PLANT P.O. BOX 308 IOLA, KS 66749	View Facility Information	**YES**	NO	NO	NO	NO

Go To Top Of The Page

Total Number of Facilities Displayed: 1

TETRA TECH EM INC.

February 20, 2007

Mr. Roy Crossland
START Project Officer
U.S. Environmental Protection Agency, Region 7
901 North 5th Street
Kansas City, Kansas 66101

Subject: **Preliminary Assessment**
United Zinc No. 1, Iola, Kansas
EPA ID: KSN000705026
U.S. EPA Region 7 START 3, Contract No. EP-S7-06-01,
Task Order No. 0038.000
Task Monitor: Ron King, Site Assessment Team Leader

Dear Mr. Crossland:

The Tetra Tech EM Inc. is submitting the enclosed Preliminary Assessment Report for the above-referenced facility. A Hazard Ranking System scoring memorandum will be submitted separately. If you have any questions or comments regarding this submittal, please call the project manager at (913) 495-3920.

Sincerely,

Stephanie Luebbering, CHMM
START Project Manager

for Ted Faile, PG, CHMM
START Program Manager

12

Enclosure

8030 Flint Street, Lenexa, KS 66214
Tel 913.894.2600 Fax 913.894.6295
www.ttemi.com

X9004.06.0038.000

PRELIMINARY ASSESSMENT
UNITED ZINC NO. 1
IOLA, KANSAS

CERCLIS ID No. KSN000705026

Superfund Technical Assessment and Response Team (START) 3

Contract No. EP-S7-06-01, Task Order No. 0038

Prepared For:

U.S. Environmental Protection Agency
Region 7
901 North 5th Street
Kansas City, Kansas 66101

February 20, 2007

Prepared By:

Tetra Tech EM Inc.
8030 Flint Street
Lenexa, Kansas 66214
(913) 894-2600

CONTENTS

Section **Page**

1.0 INTRODUCTION 1

2.0 SITE DESCRIPTION AND HISTORY 2

2.1 SITE LOCATION 2
2.2 SITE DESCRIPTION 2
2.3 OPERATIONAL HISTORY 3
2.4 REGULATORY INVOLVEMENT 3

2.4.1 Kansas Department of Health and Environment 3
2.4.2 U.S. Environmental Protection Agency 4

3.0 INVESTIGATIVE EFFORTS 5

3.1 PREVIOUS SAMPLING 5

3.1.1 Smelter Waste Sampling 5
3.1.2 Soil Sampling 5
3.1.3 Groundwater Sampling 7
3.1.4 Surface Water and Sediment Sampling 7

3.2 PA SAMPLING 7

3.2.1 Soil Sampling 8
3.2.2 Groundwater Sampling 11
3.2.3 Surface Water and Sediment Sampling 11

4.0 HAZARD RANKING SYSTEM FACTORS 11

4.1 SOURCES OF CONTAMINATION 12
4.2 GROUNDWATER PATHWAY 12
4.3 SURFACE WATER PATHWAY 12
4.4 SOIL EXPOSURE AND AIR PATHWAYS 13

4.4.1 Physical Conditions 13
4.4.2 Soil and Air Targets 14
4.4.3 Soil Exposure and Air Pathway Conclusion 14

5.0 EMERGENCY RESPONSE CONSIDERATIONS 14

6.0 SUMMARY 15

7.0 REFERENCES 17

CONTENTS (Continued)

Appendices

A FIGURES

B RESIDENTIAL FIELD SCREENING FORMS

C FIELD SHEETS AND CHAIN-OF-CUSTODY RECORDS

D ANALYTICAL RESULTS

E. LEAD LABORATORY RESULTS FOR PA SOIL SAMPLES

TABLES

Table **Page**

1 SUMMARY OF LABORATORY LEAD CONCENTRATIONS EXCEEDING KDHE RSK RESIDENTIAL SOIL PATHWAY VALUE 9

1.0 INTRODUCTION

The U.S. Environmental Protection Agency (EPA), Region 7, under the authority of the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA) and the Superfund Amendments and Reauthorization Act of 1986 (SARA), tasked Tetra Tech EM, Inc. (Tetra Tech) to conduct a Preliminary Assessment (PA) at the United Zinc No. 1 (United Zinc) facility in Iola, Allen County, Kansas, under Superfund Technical Assessment and Response Team (START) 3 Contract Number EP-S7-06-01, Task Order Number 0038.

The purpose of this PA is to review existing information on United Zinc and its environs to assess the threat(s), if any, posed to public health, welfare, or the environment, and to determine if further investigation under CERCLA/SARA is warranted. The scope of the PA includes reviewing information available from federal, state, and local agencies; summarizing field screenings conducted on surface soils with a portable x-ray fluorescent (XRF) spectrometer; and reviewing analytical data from samples taken at the screened locations and submitted to the Region 7 EPA laboratory. The samples were obtained during both the Removal Site Evaluation (RSE) and the Removal Action (RA) activities, and the analyses were for arsenic, barium, cadmium, lead, and zinc.

Using these sources of existing information and sampling data, the facility is then evaluated using the EPA Hazard Ranking System (HRS) criteria to assess the relative threat associated with actual or potential releases of hazardous substances at United Zinc. The HRS has been adopted by the EPA to help set priorities for further evaluation and eventual remedial action at hazardous waste sites. The HRS is the primary method of determining a site's eligibility for placement on the National Priorities List (NPL). The NPL identifies facilities at which the EPA may conduct remedial response actions. This report summarizes the findings of these preliminary investigative activities.

United Zinc was identified as a potential hazardous waste site and entered into the Comprehensive Environmental Response, Compensation, and Liability Information System (CERCLIS) on October 4, 2005 (KSN000705026) (EPA 2006).

Apparent Problem

The operational history of the facility is described in Section 2.3. Previous investigations have documented elevated concentrations of arsenic, barium, cadmium, lead, and zinc in the surface soils at

day care facilities, schools, parks, and residential properties surrounding the former zinc and lead smelting facility.

2.0 SITE DESCRIPTION AND HISTORY

The facility location, description, operational history, waste characteristics, and previous investigations at United Zinc are discussed below.

2.1 SITE LOCATION

United Zinc is located within the city boundaries of Iola, Allen County, Kansas, on the north side of Highway 54 along Kansas Drive, and is the location of the former United Zinc and Chemical Company Zinc and Lead Smelter. The facility is located on the east side of Iola within a mixture of residential and commercial properties. United Zinc is located in Sections 25 and 36 of Township 24 South, Range 18 East (Kansas Department of Health and Environment [KDHE] 2005), as depicted on the U.S. Geological Survey (USGS) 7.5-minute topographic quadrangle map of Iola, Kansas (USGS 1984). The approximate geographic coordinates for the central portion of the facility are 37.9222800 degrees north latitude and 95.385900 degrees west longitude (Maxim Technologies, Inc. [Maxim] 2003). The location of the facility is shown in Appendix A, Figure 1.

2.2 SITE DESCRIPTION

The former United Zinc smelter facility was comprised of 10 parcels of land, equivalent to approximately 17 acres, but the overall site area evaluated includes a much larger surrounding section. The property has been graded, leveled, and developed since the former smelter operations ceased in the 1920s (Maxim 2003). Most of the property where the former smelter was located is vacant but includes the following businesses: Brenntag Southwest, Inc. (Chemical Distribution Company), a MFA Distributor, the Superflea Flea Market, Tucker's Flea Market, a portion of a concrete mixing facility, and some pastureland (Maxim 2003, KDHE 2005). The facility is bordered on the north by residential properties; on the east by the East Iola Site (the location of the former Prime Western Smelting Company Works No. 3 and J.B. Kirk Gas and Smelting Company), a car wash, a former Tyson processing facility, and a movie theater; on the south by a restaurant, a dry cleaner, a car dealership, and agricultural land; and on the west by the Colberly Site (the location of the former United Iron Works Company), a truck repair facility, and the remaining portion of the concrete mixing facility (Maxim 2003). The facility is also surrounded by residential neighborhoods and two schools (KDHE 2005). The Iola Preschool for the Exceptional (Iola Preschool) is located northeast of United Zinc, and the McKinley Elementary School (McKinley School)

is located southwest of United Zinc (Terranext 2005). The facility layout is shown in Appendix A, Figure 2.

2.3 OPERATIONAL HISTORY

According to the historic plat maps and Sanborn fire insurance maps, activities at the United Zinc facility began as early as 1901. At that time, the facility was called the Standard Acid Company and included three furnaces, 12 retorts, and a pottery room with kilns. Mr. William Lanyon owned the property between 1901 and 1902. The property was transferred to United Zinc in 1902. United Zinc and Chemical Company owned and operated the primary zinc smelter until approximately 1912. No known active smelting facilities were documented on the property after 1912. Historical documentation indicates that the United Zinc facility contained four furnaces, eight kilns, 14 retorts, and several ore crushers and roasters (KDHE 2005). The United Zinc facility was designed to capture the sulfur dioxide fumes generated during roasting the ore to make sulfuric acid; therefore United Zinc likely utilized the acid chambers associated with the Standard Acid facility (KDHE 2006).

During a 2003 Phase I site reconnaissance, smelter waste was observed at United Zinc, and the quantity was estimated as approximately 1,800 cubic yards concentrated in the southwest corner of the vacant property at United Zinc (Burns & McDonnell Engineering Company Inc. [Burns & McDonnell] 2004, Terranext 2005). Zinc smelter waste is known to contain elevated concentrations of heavy metals from smelting activities—including arsenic, cadmium, lead, and zinc. Sampling of the soil, groundwater, sediment, surface water, smelter waste, and surrounding areas began in 2004 to determine the potential impact from the former smelting operations at United Zinc. The results are discussed in Section 3.1.

2.4 REGULATORY INVOLVEMENT

Requests for information were made to agencies possibly involved with United Zinc. A summary of involvement by these agencies is as follows.

2.4.1 Kansas Department of Health and Environment

A Phase I Focused Former Smelter Assessment (FFSA) was completed on behalf of the KDHE State Water Plan (SWP) program in December 2003. The FFSA identified a Recognized Environmental Condition (REC) at United Zinc based on observation of smelter waste during the site reconnaissance. The smelter waste appeared to have impacted the vegetative growth in the area of the former smelter operations. In addition, elevated concentrations of lead had been previously documented in the surface

soils on the property immediately adjacent to United Zinc from other documented smelting operations, including the East Iola Site and the Colberly Site. A Phase II Assessment was recommended at United Zinc and in the area surrounding the smelting activities to investigate the potential risk of human exposure to heavy metal-impacted waste and surface soil (Maxim 2003).

Sampling of the soil, smelter waste, groundwater, surface water, and sediment was conducted during the Phase II FFSA at United Zinc in December 2004 on behalf of the KDHE SWP. The sampling identified elevated levels of arsenic, cadmium, lead, and zinc above the background soil sample concentrations. The Phase II FFSA also indicated potential contamination near residents and at both the McKinley School and the Iola Preschool (Burns & McDonnell 2004, KDHE 2005).

KDHE collected samples in June 2005 from 50 residential yards located between United Zinc and the McKinley School and the Iola Preschool. Arsenic was detected above its KDHE Risk-Based Standards for Kansas (RSK) Residential Soil Pathway level of 11 milligrams per kilogram (mg/kg) in 18 of the residential samples (Terranext 2005, KDHE 2003). In addition, lead was found above its KDHE RSK Residential Soil Pathway level of 800 mg/kg in 12 of the residential samples, some of the same samples with elevated arsenic concentrations. Cadmium and zinc were detected in all of the soil samples at concentrations below their KDHE RSK Residential Soil Pathway values (Terranext 2005, KDHE 2003, 2005).

A Preliminary RSE was conducted by KDHE in September 2005. In support of the 2005 RSE, KDHE collected additional samples from sensitive receptors areas near United Zinc, including the McKinley School and Iola Preschool. The results exhibited elevated levels of arsenic, cadmium, lead, and zinc at residential and non-residential properties. The presence of lead above 400 mg/kg was also identified within the McKinley School playground and adjacent areas. The Preliminary RSE recommended further removal site evaluation and removal action consideration (KDHE 2005).

2.4.2 U.S. Environmental Protection Agency

Tetra Tech, under contract to the EPA, prepared a RSE report in September 2006. The sampling activities for the RSE were conducted during April and May 2006. During the RSE, approximately 260 properties were screened for lead using a XRF, and approximately 10 percent of the screened samples were submitted for laboratory confirmation analyses of arsenic, barium, cadmium, lead, and zinc. Thirty-four properties were identified where either the XRF and/or laboratory data indicated lead concentrations warranted a time-critical removal action (400 mg/kg for schools and daycares; 800 mg/kg for residential

properties; and 1,000 mg/kg for commercial properties). The 34 properties included 19 private residences, 10 daycare facilities, two elementary schools, and three commercial properties (Tetra Tech 2006a).

United Zinc was not listed in the Resource Conservation and Recovery Information System (RCRIS) database as of February 7, 2007 (EPA 2007b).

3.0 INVESTIGATIVE EFFORTS

Section 3.0 discusses historical investigations, as well as the current PA field sampling and quality assurance (QA)/quality control (QC) activities performed at United Zinc.

3.1 PREVIOUS SAMPLING

This section describes previous sampling in addition to that conducted at United Zinc, which was discussed in Section 2.4.2 above.

3.1.1 Smelter Waste Sampling

Smelter waste was sampled from four locations at United Zinc during the Phase II FFSA. The smelter waste was field screened using the XRF, and one of the four samples was submitted to the laboratory for arsenic, cadmium, lead, and zinc analyses. The field screening results identified concentrations of arsenic, cadmium, lead, and zinc above their respective KDHE RSK values, and the laboratory data confirmed concentrations of arsenic and lead above their respective KDHE RSK values (Burns & McDonnell 2004).

3.1.2 Soil Sampling

During the Phase II FFSA, the surface soil was screened and sampled on and off the former United Zinc property. The soil samples were screened in the field with a portable XRF, and a portion of the samples were submitted to a laboratory for analyses for arsenic, cadmium, lead, and zinc. In the surface soil samples collected on site at the United Zinc property, all four metals were detected at levels exceeding their respective KDHE RSK values. For the soil samples collected off the United Zinc property: (1) the XRF field screening identified concentrations of arsenic, cadmium, and lead above their respective KDHE RSK values; and (2) results of laboratory confirmatory analyses indicted that only arsenic and lead exceeded their respective KDHE RSK values (Burns & McDonnell 2004).

In addition, three direct-push borings were installed and sampling from them occurred during the Phase II FFSA. The borings were screened in the field with the XRF, and the sample from each borehole exhibiting the highest concentration of metals was submitted for laboratory analyses for arsenic, cadmium, lead, and zinc. According to both the field screening and the laboratory data, the soil samples collected from the borings contained concentrations of arsenic, cadmium, and lead exceeding their respective KDHE RSK values.

Surface soils from four sensitive receptor areas near the McKinley School and Iola Preschool were screened in-situ with the portable XRF. The XRF field screening results detected cadmium and lead above their respective KDHE RSK values. Laboratory confirmatory results identified concentrations of arsenic and lead exceeding their respective KDHE RSK values in soil samples from those areas (Burns & McDonnell 2004).

Discrete soil samples were collected from 50 randomly selected residential yards between United Zinc and two sensitive receptors, the McKinley School and Iola Preschool—from a depth interval of 1 to 3 inches below ground surface (bgs). The soil samples were submitted for analyses for arsenic, cadmium, lead, and zinc. Arsenic was detected above its RSK value, specifically north of United Zinc along Willow Drive and south of United Zinc at the intersection of Madison Street and Tennessee Street. Lead was detected in all of the soil samples, ranging from 51.2 mg/kg to 1,800 mg/kg. Eighteen of the surface soil samples contained concentrations of lead exceeding its RSK value, and the highest concentrations identified were located at the northwest corner of the Willow Drive and Vermont Street intersection and along Ohio Street south of the United Zinc facility. Cadmium and zinc were detected in all of the soil samples, but below the RSK values for these contaminants (Terranext 2005).

The purpose of the Preliminary RSE was to obtain additional sampling data from sensitive receptor areas around the McKinley School and Iola Preschool. Surface soil samples were collected in a grid formation and were screened on site with a XRF for lead; six of the samples were sent to a laboratory for confirmation analyses. The results identified lead-contaminated soil exceeding 400 mg/kg on the McKinley School playground, generally linear and parallel to the streets within 10-15 feet of the fence surrounding the school (KDHE 2005).

During the RSE, 34 properties were identified where the XRF and/or laboratory data indicated lead concentrations warranted a time-critical removal action (400 mg/kg for schools and daycares, 800 mg/kg for residential properties, and 1,000 mg/kg for commercial properties) (Tetra Tech 2006a).

3.1.3 Groundwater Sampling

Following the collection of soil cores from the direct-push borings during the Phase II FFSA, temporary piezometers were installed in the boreholes. Groundwater samples were collected from three piezometers, and were field filtered and submitted for analyses for arsenic, cadmium, lead, and zinc. Cadmium was detected in two of the groundwater samples at concentrations of 0.0068 ,milligrams per liter (mg/L) and 0.073 mg/L, and lead was detected in one groundwater sample at a concentration of 0.05 mg/L. The concentrations of both the cadmium and lead detected in the groundwater samples exceeded their respective KDHE RSK values (Burns & McDonnell 2004).

3.1.4 Surface Water and Sediment Sampling

During the Phase II FFSA, two surface water and sediment samples were collected south of the United Zinc facility along a tributary to Rock Creek. The sediment samples were screened in the field with the XRF. One of the sediment samples and both surface water samples were submitted to the laboratory for analyses for arsenic, cadmium, lead, and zinc. The only metal detected above its KDHE RSK value was arsenic in the two sediment samples—at concentrations of 6.6 mg/kg and 6.2 mg/kg. No other metal was detected above its KDHE RSK value in either the surface water or sediment samples (Burns & McDonnell 2004).

3.2 PA SAMPLING

Since June 2006, Tetra Tech in support of EPA has been screening residential properties for possible soil contamination. Tetra Tech prepared two site-specific Quality Assurance Project Plans (QAPP) for United Zinc. The first QAPP was for the integrated RSE/PA and the second QAPP was written for the RA activities. The QAPPs were approved by EPA subsequent to their submission in April and August 2006 (Tetra Tech 2006b, c). Field activities have been conducted in accordance with the approved QAPPs. A residential property screening form was completed at each residence where surface soil samples were collected and screened (see Appendix B). Samples for Analytical Services Requests (ASR) 3151, 3152, 3153, 3154, 3155, 3156, 3157, and 3158 were hand delivered to the EPA Region 7 laboratory. Field sheets and chain-of-custody records are in Appendix C, and the complete validated analytical results are in Appendix D. The data were validated by EPA Region 7 Quality Assurance personnel. Sampling methodologies, locations, analyses, and analytical results for the PA activities are summarized below.

3.2.1 Soil Sampling

The screening process entails delineating each residential property selected for screening into at least four cells. The cells radiate out 100 feet from the drip zone around the house or until the property line is reached, whichever is less. The maximum size of each cell is 100 feet by 100 feet. Additional areas or cells that can be screened include the drop zone; fine-grained material if used in driveways, sidewalks, or under carports; vegetable gardens; and children's play areas that are at least 25 feet by 25 feet. A composite sample consisting of nine aliquots, each collected from 0 to 2 inches bgs, is collected from each cell and placed in a labeled, sealed plastic bag. All samples are transported to the sample preparation facility and placed in clean, dedicated aluminum pie pans. The samples are dried completely, homogenized, passed through a sieve, and then screened for lead using a XRF. An average of three readings are calculated and recorded on the field sheets. At least 10 percent of the screened soils samples are submitted to the EPA Region 7 laboratory for confirmation analyses for arsenic, barium, cadmium, lead, and zinc. Locations of the samples submitted to the laboratory are illustrated on Figure 3 (see Appendix A).

Approximately 180 soil samples were collected between August and November 2006 for the PA and were submitted to the EPA Region 7 laboratory to be analyzed for arsenic, cadmium, lead and zinc. Each soil sample was collected in one 8-ounce jar. Samples were placed into a cooler containing ice, where they were stored at a temperature at or below 4 degrees Celsius (°C) pending submittal to the EPA Region 7 laboratory.

Analytical Data Summary

Arsenic was detected in 160 soil samples collected during the PA at concentrations exceeding its Superfund Chemical Data Matrix (SCDM) Cancer Risk (CR) screening concentration of 0.43 mg/kg, ranging from 5.91 mg/kg to 178 mg/kg. In addition, 32 of those samples had concentrations that exceeded the SCDM Reference Dose (RfD) screening concentration of 23 mg/kg for arsenic (EPA 2004). The background concentrations of arsenic ranged from 8 mg/kg to 13 mg/kg. Barium and zinc were detected in all the soil samples at concentrations below their SCDM RfD screening concentrations of 5,500 mg/kg and 23,000 mg/kg, respectively (EPA 2004). Cadmium was detected in soil sample 3157-6 at a concentration of 45.4 mg/kg, which exceeds its RfD screening concentration. The remaining soil samples contained concentrations of cadmium below its RfD screening concentration of 39 mg/kg (EPA 2004). The lead concentrations for the soil samples collected during the PA are included in Attachment E. A total of 83 soil samples analyzed by the EPA Region 7 Laboratory contained lead concentrations

exceeding its KDHE RSK Residential Soil Pathway value of 800 mg/kg, ranging in concentrations from 805 mg/kg to 8,390 mg/kg. All of these samples also exceeded lead background concentrations that ranged from 176 mg/kg to 397 mg/kg. These samples are shown in Table 1.

TABLE 1

SUMMARY OF LABORATORY LEAD CONCENTRATIONS EXCEEDING KDHE RSK RESIDENTIAL SOIL PATHWAY VALUE
UNITED ZINC – IOLA, KANSAS

Sample Number	EPA Property ID	Date Collected	Lab Result (mg/kg)
3151-2	EPA #64, Cell 1	08/08/2006	907
3151-4	EPA #76, Cell 3	08/08/2006	817
3151-5	EPA #183, Cell 1	08/08/2006	1,440
3151-6	EPA #261, Cell 1	08/09/2006	805
3151-7	EPA #266, Cell 1	08/09/2006	1,660
3152-1	EPA #254, Cell 1	08/19/2006	946
3152-2	EPA #285, Cell 2	08/21/2006	991
3152-4	EPA #295, Cell 1	08/22/2006	1,200
3152-5	EPA #274, Cell 2	08/16/2006	1,640
3152-6	EPA #3, Cell 7	08/16/2006	838
3152-7	EPA #297, Cell 1	08/23/2006	1,140
3152-8	EPA #299, Cell 2	08/24/2006	1,130
3152-12	EPA #328, Cell 4	08/29/2006	1,050
3152-13	EPA #334, Cell 1	08/29/2006	1,050
3152-14	EPA #325, Cell 1	08/30/2006	1,010
3152-16	EPA #294, Cell 1	08/30/2006	996
3152-17	EPA #309, Cell 2	08/30/2006	2,010
3152-19	EPA #314, Cell 3	08/31/2006	1,270
3153-13	EPA #14, Cell 3	09/14/2006	1,690
3153-16	EPA #378, Cell 2	09/15/2006	1,050
3154-7	EPA #65, Cell 2	09/25/2006	1,480
3154-9	EPA #411, Cell 1	09/27/2006	1,280
3154-10	EPA #397, Cell 3	09/16/2006	1,390
3154-11	EPA #452, Cell 5	09/20/2006	1,380
3154-12	EPA #467, Cell 4	09/20/2006	857
3154-13	EPA #467, Cell 2	09/20/2006	1,040
3154-14	EPA #434, Cell 1	09/21/2006	916
3154-15	EPA #463, Cell 2	09/21/2006	1,140
3154-25	EPA #565, Cell 1	09/26/2006	1,410
3154-26	EPA #579, Cell 2	09/27/2006	1,500
3154-27	EPA #579, Cell 4	09/27/2006	839
3154-28	EPA #567, Cell 5	09/27/2006	1,190
3154-29	EPA #554, Cell 3	09/27/2006	916
3154-30	EPA #588, Cell 1	09/28/2006	970
3154-31	EPA #588, Cell 3	09/28/2006	1,690
3154-32	EPA #593, Cell 1	09/28/2006	2,520

TABLE 1 (Continued)

SUMMARY OF LABORATORY LEAD CONCENTRATIONS EXCEEDING KDHE RSK RESIDENTIAL SOIL PATHWAY VALUE
UNITED ZINC – IOLA, KANSAS

Sample Number	EPA Property ID	Date Collected	Lab Result (mg/kg)
3154-33	EPA #591, Cell 2	09/28/2006	1,230
3154-34	EPA #468, Cell 2	09/28/2006	1,010
3154-35	EPA #532, Cell 2	09/29/2006	1,920
3155-4	EPA #514, Cell 1	10/03/2006	908
3155-5	EPA #625, Cell 1	10/04/2006	993
3155-9	EPA #607, Cell 1	10/04/2006	1,410
3155-11	EPA #234, Cell 2	10/05/2006	6,430
3155-12	EPA #6010	10/05/2006	1,060
3155-14	EPA #662, Cell 3	10/05/2006	1,250
3155-15	EPA #621, Cell 1	10/06/2006	1,870
3155-17	EPA #658, Cell 1	10/09/2006	3,810
3156-2	EPA #771, Cell 3	10/16/2006	3,620
3156-4	EPA #739, Cell 2	10/16/2006	1,260
3156-5	EPA #755, Cell 4	10/17/2006	1,230
3156-10	EPA #775, Cell 2	10/17/2006	1,410
3156-15	EPA #648, Cell 2	10/18/2006	1,360
3156-16	EPA #651, Cell 3	10/18/2006	1,780
3156-17	EPA #589, Cell 4	10/18/2006	1,360
3156-18	EPA #759, Cell 4	10/19/2006	1,570
3156-19	EPA #443, Cell 1	10/19/2006	3,110
3156-20	EPA #692, Cell 1	10/19/2006	1,470
3156-21	EPA #613, Cell 4	10/29/2006	3,070
3156-22	EPA #400, Cell 4	10/19/2006	1,360
3156-23	EPA #621, Cell 2	10/19/2006	842
3156-24	EPA #793, Cell 3	10/20/2006	831
3156-25	EPA #750, Cell 1	10/19/2006	861
3156-27	EPA 446, Cell 3	10/20/2006	921
3156-29	EPA #417, Cell 1	10/24/2006	2,270
3156-30	EPA #796, Cell 1	10/24/2006	1,050
3156-32	EPA #806, Cell 1	10/24/2006	2,100
3156-33	EPA #787, Cell 1	10/24/2006	825
3157-1	EPA #525, Cell 4	10/30/2006	2,040 J
3157-3	EPA #480, Cell 2	10/31/2006	824
3157-6	EPA #408, Cell 2	10/31/2006	8,390
3157-7	EPA #883, Cell 2	11/01/2006	871
3157-12	EPA #813, Cell 1	11/02/2006	950
3157-13	EPA #887, Cell 2	11/03/2006	1,120
3157-14	EPA #505, Cell 1	11/06/2006	1,520
3157-15	EPA #611, Cell 3	11/06/2006	3,980
3157-18	EPA #919, Cell 3	11/09/2006	1,320
3158-1	EPA #927, Cell2	11/13/2006	2,640
3158-2	EPA #931, Cell 2	11/15/2006	1,260
3158-5	EPA #975, Cell 2	NA	1,150
3158-8	EPA #968, Cell 5	11/27/2006	940
3158-9	EPA #957, Cell 3	11/28/2006	1,620

TABLE 1 (Continued)

SUMMARY OF LABORATORY LEAD CONCENTRATIONS EXCEEDING KDHE RSK RESIDENTIAL SOIL PATHWAY VALUE
UNITED ZINC – IOLA, KANSAS

Sample Number	EPA Property ID	Date Collected	Lab Result (mg/kg)
3158-10	EPA #958, Cell 2	11/28/2006	5,550
3158-11	EPA #998, Cell 1	11/29/2006	961

Notes:

EPA	United States Environmental Protection Agency
ID	Identification
J	Identification of the analyte is acceptable: the reported value is an estimate
mg/kg	Milligrams per kilogram
NA	Not available
#	Number

3.2.2 Groundwater Sampling

No groundwater samples were collected as part of the PA activities. The primary water source of drinking water for the City of Iola is surface water (EPA 2007a). According to the Kansas Geological Survey database, approximately 109 registered wells are within 4 miles of the former United Zinc smelter facility; however, only eight domestic wells are listed as active (Kansas Geological Survey (KGS) 2007).

3.2.3 Surface Water and Sediment Sampling

Surface water runoff from United Zinc enters Rock Creek, which is located east of the former smelter property. Rock Creek drains into the Neosho River southwest of the United Zinc facility. Based on the Phase II FFSA analytical results, no additional surface water and sediment samples were collected as part of the PA.

4.0 HAZARD RANKING SYSTEM FACTORS

This section discusses the sources of contamination and the contaminant migration pathways evaluated under the Hazard Ranking System.

4.1 SOURCES OF CONTAMINATION

Sources of hazardous substances associated with the facility include, but may not be limited to:

- Pile – At least four separate piles of smelter waste were identified during the FFSA site reconnaissance. The quantity of smelter waste observed at United Zinc was estimated as approximately 1,800 cubic yards, and was concentrated in the southwest corner of the vacant property at United Zinc (Burns & McDonnell 2004, Terranext 2005). The smelter waste was sampled from each pile during the Phase II FFSA at United Zinc. The piles were field screened using the XRF, and one of the four samples was submitted to the laboratory for analyses for arsenic, cadmium, lead, and zinc. The field screening results identified concentrations of arsenic, cadmium, lead, and zinc above their respective KDHE RSK values, and the laboratory data confirmed concentrations of arsenic and lead above their respective KDHE RSK values (Burns & McDonnell 2004).

- Contaminated soil – Arsenic and cadmium have been identified in soil at concentrations exceeding their SCDM health-based benchmarks, and lead has been found at concentrations exceeding its KDHE RSK Residential Soil Pathway value on and off the United Zinc property—as shown on Figure 4 in Appendix A.

4.2 GROUNDWATER PATHWAY

The primary source of drinking water for the City of Iola is surface water (EPA 2007a). The nearest surface water intake is 8 miles south of the facility on the Neosho River; therefore, the metals detected in the source samples and in the surface soil are unlikely to impact the drinking water intake located along the Neosho River. The sampling of temporary piezometers during the Phase II FFSA indicated concentrations of cadmium and lead in the groundwater exceeding their respective KDHE RSK values, but arsenic and zinc were detected at concentrations below their KDHE RSK values (Burns & McDonnell 2004). Neither arsenic nor zinc was detected at concentrations exceeding its SCDM health-based benchmarks. Lead was detected in one of the groundwater samples at a concentration exceeding its action level. Cadmium was detected in two groundwater samples exceeding its Maximum Contaminant Level and in one sample exceeding its SCDM RfD screening concentration (EPA 2004). The closest registered well is located within 0.5 mile of United Zinc. Most registered wells within 4 miles of the former United Zinc facility are plugged, and only eight domestic wells are listed as active within a 4-mile target distance limit (KGS 2007).

4.3 SURFACE WATER PATHWAY

During the Phase II FFSA, two surface water and sediment samples were collected south of United Zinc along a tributary to Rock Creek. The sediment samples were screened in the field with the XRF. One of the sediment samples and both surface water samples were submitted to the laboratory for analyses for arsenic, cadmium, lead, and zinc. The only metal detected above its KDHE RSK value was arsenic in the

two sediment samples—at concentrations of 6.6 mg/kg and 6.2 mg/kg. No other metal was detected above its KDHE RSK value in either the surface water or sediment samples (Burns & McDonnell 2004). Two drinking water intakes exist 8 miles downstream of United Zinc, on the Neosho River. No fisheries or sensitive environments have been identified within the 15-mile target distance limit (TDL) of United Zinc.

4.4 SOIL EXPOSURE AND AIR PATHWAYS

Section 4.4 discusses the physical conditions, soil and air targets, soil sampling summary, analytical data summary, and conclusions drawn from the analytical data for the soil samples collected from the suspected sources areas. Soil samples were collected from residential yards, and slag piles identified potential source areas and nearby properties. Air samples were not collected because actual or potential contamination to the air pathway was not considered significant.

4.4.1 Physical Conditions

Allen County is located within the Osage Plains, and the land is predominantly level with few outstanding differences in the relief of the land. The U.S. Department of Agriculture (USDA) has classified soil in the area as Kenoma silt loam. The Kenoma soil type is described by the USDA as deep, moderately well-drained, very slowly permeable soils on the uplands. These soils are formed in material weathered from sediments high in content of silt and clay (USDA 1978).

The United Zinc facility encompasses 10 parcels of land, equivalent to approximately 17 acres, but the site includes a much larger surrounding area. Investigative actions are underway to further characterize the site. The property has been graded, leveled, and developed since the former smelter operations ceased in the 1920s (Maxim 2003). Most of this area is currently vacant. However, Benntag Southwest, Inc., a MFA Distributor, the Superflea Flea Market, Tucker's Flea Market, a portion of a concrete mixing facility, and some pastureland are present (Maxim 2003, KDHE 2005). The facility is bordered on the north by residential property; on the east by the East Iola Site, a car wash, a former Tyson processing facility, and a movie theater; on the south by a restaurant, a dry cleaner, a car dealership, and agricultural land; and on the west by the Colberly Site, a truck repair facility, and the remaining portion of the concrete mixing facility (Maxim 2003). The facility is also surrounded by residential neighborhoods and two schools (KDHE 2005). The Iola Preschool is located northeast of United Zinc, and the McKinley School is located southwest of United Zinc (Terranext 2005).

4.4.2 Soil and Air Targets

The area surrounding the former United Zinc facility is predominantly residential, and the total population within the 4-mile TDL from the center of the United Zinc property is approximately 8,076 people. Census information indicated 193 residents within 0.25 mile; 1,066 individuals between 0.25 and 0.5 mile; 2,222 people between 0.5 and 1 mile; 3,456 residents between 1 and 2 miles; 861 people between 2 and 3 miles; and 278 individuals between 3 and 4 miles from the United Zinc facility (Missouri Census Data Center 2005). In addition, five schools and two daycares are mixed in with the residential areas surrounding United Zinc.

4.4.3 Soil Exposure and Air Pathway Conclusion

Analytical results of the soil samples collected during the PA activities from residential yards identified arsenic, barium, cadmium, lead, and zinc in the surface soil samples. Arsenic was detected in 160 soil samples at concentrations exceeding its SCDM CR screening concentration. Barium and zinc were detected in all of the soil samples at concentrations below their respective SCDM health-based benchmarks. Cadmium was detected in several soil samples, but only one soil sample contained cadmium at a concentration exceeding its RfD screening concentration. Lead was the most prevalent contaminant at the site. In fact, between August and November 2006, lead was identified and confirmed by the laboratory as exceeding its KDHE RSK Residential Soil Pathway value of 800 mg/kg in 83 soil samples. Background concentrations of lead identified northwest of the United Zinc facility ranged from 176 mg/kg to 397 mg/kg. Forty-four of those samples highlighted in Table 1 exceed three times the highest background concentration of lead.

No air pathway samples were collected because actual or potential contamination to the air migration pathway was not considered significant.

5.0 EMERGENCY RESPONSE CONSIDERATIONS

The National Contingency Plan [40 CFR 300.415(b)(2)] authorizes the EPA to consider emergency response actions at those facilities that pose an imminent threat to human health or the environment. For the following reasons, a referral to EPA Regions 7 for emergency response activities appears necessary:

- The area of soil contamination expands beyond the United Zinc property boundaries, as shown on Figure 4. The contaminated soil boundary was derived by drawing a ring around all the residential soil samples that exceeded 800 mg/kg for lead. This boundary also includes the United Zinc facility, because contamination was identified on the property during historical investigations.

6.0 SUMMARY

The former United Zinc smelter facility was comprised of 10 parcels of land, equivalent to approximately 17 acres, but the overall site area evaluated includes a much larger surrounding section. The property has been graded, leveled, and developed since the former smelter operations ceased in the 1920s (Maxim 2003). Most of the property where the former smelter was located is vacant but includes the following structures: Brenntag Southwest, Inc., a MFA Distributor, the Superflea Flea Market, Tucker's Flea Market, a portion of a concrete mixing facility, and some pastureland (Maxim 2003, KDHE 2005). The facility is bordered on the north by residential property; on the east by the East Iola Site, a car wash, a former Tyson processing facility, and a movie theater; on the south by a restaurant, a dry cleaner, a car dealership, and agricultural land; and on the west by the Colberly Site, a truck repair facility, and the remaining portion of the concrete mixing facility (Maxim 2003). The facility is also surrounded by residential neighborhoods and two schools (KDHE 2005). Iola Preschool is located northeast of United Zinc, and the McKinley School is located southwest of United Zinc (Terranext 2005).

During the 2003 Phase I site reconnaissance, smelter waste was observed, and the quantity was estimated as approximately 1,800 cubic yards, concentrated in the southwest corner of the vacant property at United Zinc (Burns & McDonnell 2004, Terranext 2005). Zinc smelter waste is known to contain elevated concentrations of heavy metals from smelting activities—including arsenic, cadmium, lead, and zinc. Sampling of the soil, groundwater, sediment, surface water, smelter waste, and surrounding areas began in 2004 to determine the potential impact from the former smelting operations at United Zinc.

A release of lead from United Zinc to the soil has been established based on the results of the PA sampling collected from August through November 2006. The groundwater, surface water, and air migration pathways are not a concern because exposure is limited.

United Zinc is not listed in the EPA RCRIS database, but was identified as a potential hazardous waste site and entered into CERCLIS in 2005.

The pertinent HRS factors associated with United Zinc are as follows:

- A release of contaminants associated with past activities at the United Zinc facility has been established. Results of the ongoing PA sampling effort indicate the presence of lead at concentrations exceeding its KDHE RSK Residential Soil Pathway value.
- The area of contaminated soil includes much more than just the former United Zinc facility property, as shown on Figure 4. Lead-contaminated soil has been identified in 83

residential samples during the PA, exceeding lead's time-critical removal action value of 800 mg/kg. In addition, lead-contaminated soils were documented at two schools at concentrations above lead's time-critical removal action level of 400 mg/kg.

- The closest registered well is located within 0.5 mile of United Zinc. Most registered wells within 4 miles of the former United Zinc facility are plugged (KGS 2007). However, the primary source of drinking water in Iola is surface water.

- Two drinking water intakes exist 8 miles downstream of United Zinc, on the Neosho River. The low levels of metals detected in the source samples and soils are unlikely to impact the drinking water intake because of velocity and dilution in the stream.

- No sensitive environments are associated with the surface water pathway within 15 miles downstream of the facility.

7.0 REFERENCES

Burns & McDonnell Engineering Company Inc. (Burns & McDonnell). 2004. Phase II Focused Former Smelter Assessment of the Former United Zinc #1 Smelter in Iola, Kansas. December.

Kansas Department of Health and Environment (KDHE). 2003. Risk-Based Standards for Kansas Manual. March 1.

KDHE. 2005. Preliminary Removal Site Evaluation for United Zinc Smelter #1 Site in Iola, Kansas. September.

KDHE. 2006. Bureau of Environmental Remediation/Remedial Section – A Short History of the Zinc Smelting Industry in Kansas. December 28.

Kansas Geological Survey (KGS). 2007. KGS Index of Water Wells Database. Last updated January 31, 2007.

Missouri Census Data Center. 2005. MABLE/Geocorr2K: Geographic Correspondence Engine with Census 2000 Geography. Version 1.2. On-line Address: http://mcdc2.missouri.edu/websas/geocorr2k.html. Accessed: January 16, 2007. Last updated: January 2007.

Maxim Technologies, Inc. (Maxim). 2003. Focused Former Smelter Phase I Report. Group B Smelters. United Zinc #1 in Iola, Kansas. December 19.

Terranext. 2005. Residential Yard Soil Sampling Report for United Zinc #1 in Iola, Kansas. June 27.

Tetra Tech EM Inc. (Tetra Tech). 2006a. Removal Site Evaluation Report for United Zinc #1 Site. September 26.

Tetra Tech. 2006b. Quality Assurance Project Plan for Integrated Site Assessment of the United Zinc #1 Site in Iola, Kansas. April 7.

Tetra Tech. 2006c. Quality Assurance Project Plan for Removal Action of the United Zinc #1 Site in Iola, Kansas. August 10.

United Stated Department of Agriculture. 1978. Soil Survey of Allen County, Kansas. November.

United States Environmental Protection Agency (EPA). 2004. Superfund Chemical Data Matrix (SCDM) Table. Washington, D.C. January.

EPA. 2006. Envirofacts Warehouse. December 8. On-line address: http://oaspub.eap.gov/enviro/. Accessed on December 15, 2006.

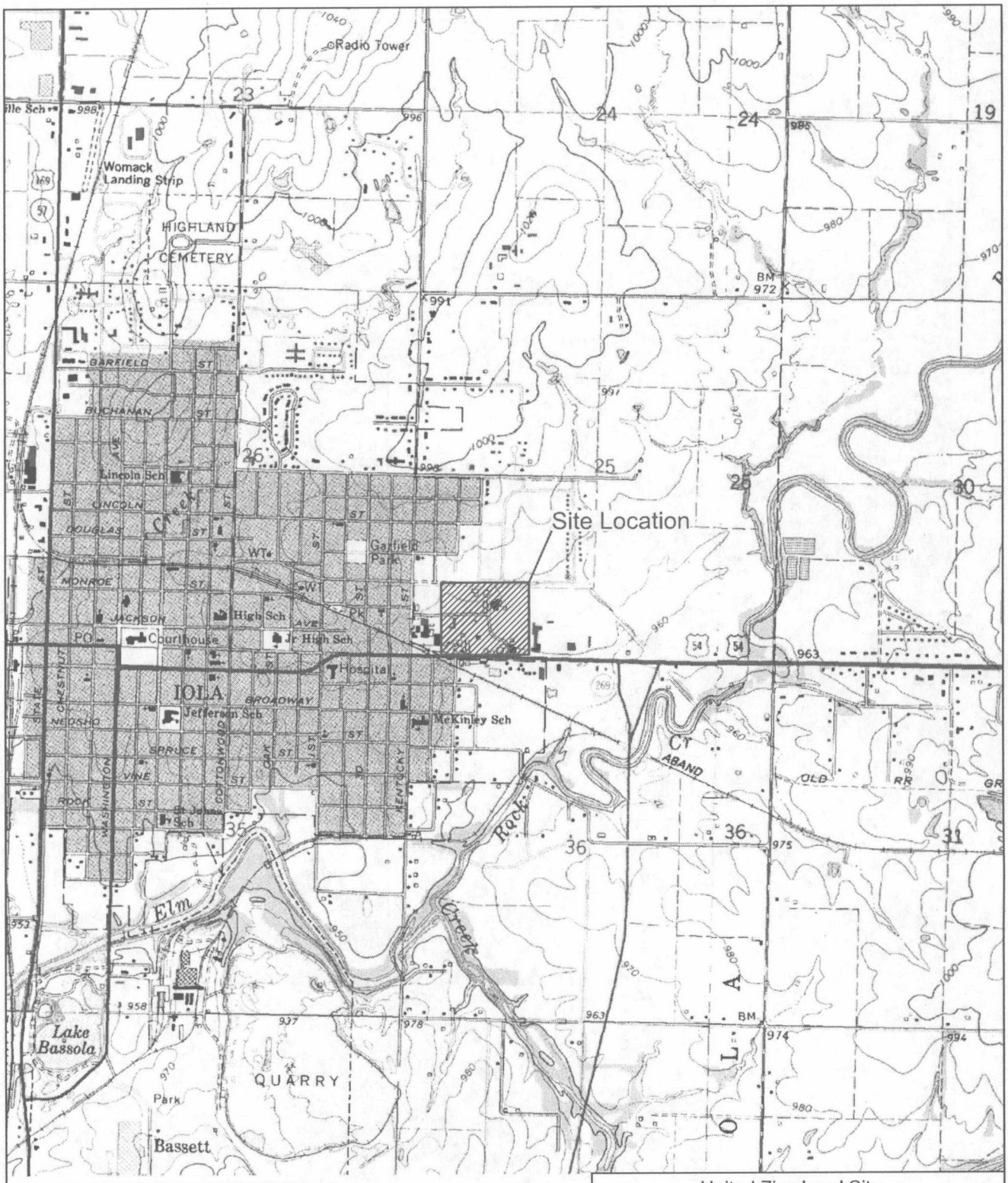
EPA. 2007a. Envirofacts Warehouse-Safe Drinking Water Information System. On-line address: http://oaspub.eap.gov/enviro/. Accessed on January 25, 2007.

EPA. 2007b. Envirofacts Warehouse. On-line address: http://oaspub.eap.gov/enviro/. Accessed on February 8, 2007.

U.S. Geological Survey (USGS). 1984. Iola, Kansas, 7.5-minute topographic quadrangle.

APPENDIX A

FIGURES



Source: USGS Allen County, KS 7.5 Minute Topo Quad, 1959, PR 1984

United Zinc Lead Site
Iola, Kansas

Figure 1
Facility Location Map

Tetra Tech EM Inc

Date: 01/17/07 Drawn By: Bill Saking Project No: I9004.L06.0038.000

X:\G\9004\0038\dwg\figure1.dwg

Source: Allen Co., Kansas DOQQ Tileset, 2003
Street Maps USA-ESRI Media Kit, 2001-2005
MAXIM Technologies Inc. Figure 2 (Group B Lead Smelters), 2003

United Zinc Lead Site
Iola, Kansas

Figure 2
Facility Map

TETRA TECH EM INC.

Legend
- Background Sample Location
- Sample Location
- Highway
- Major Road
- Local Road
- Minor Road
- Other Road
- Property Boundary

County Locator

Site Locator

N

0 400 800

Scale in Feet

Source: Allen Co., Kansas DOQQ Tileset, 2003
Street Maps USA-ESRI Media Kit, 2001-2005

United Zinc Lead Site
Iola, Kansas

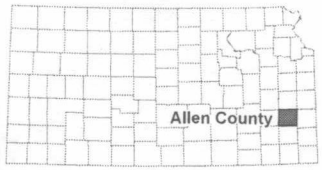
Figure 3
Sample Location Map

TETRA TECH EM INC.

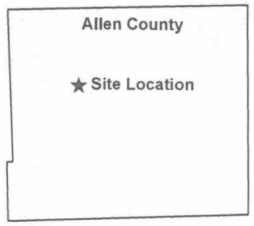
Date: 01/19/07 Drawn By: Colin Willis Project No: 190041.06.0038.000

Legend
- Sample Location
- Schools
- Slag Pile
- Highway
- Major Road
- Local Road
- Minor Road
- Other Road
- Contaminated Soil Boundary
- Property Boundary

County Locator



Site Locator



N

0 400 800

Scale in Feet

Source: Allen Co., Kansas DOQQ Tileset, 2003
Street Maps USA-ESRI Media Kit, 2001-2005

United Zinc Lead Site
Iola, Kansas

Figure 4
Lead Concentrations Exceeding KDHE Risk Residential Soil Pathway Value

TETRA TECH EM INC.

Date: 01/19/07 Drawn By: Colin Willis Project No. 19004L.06.0038.000

APPENDIX B

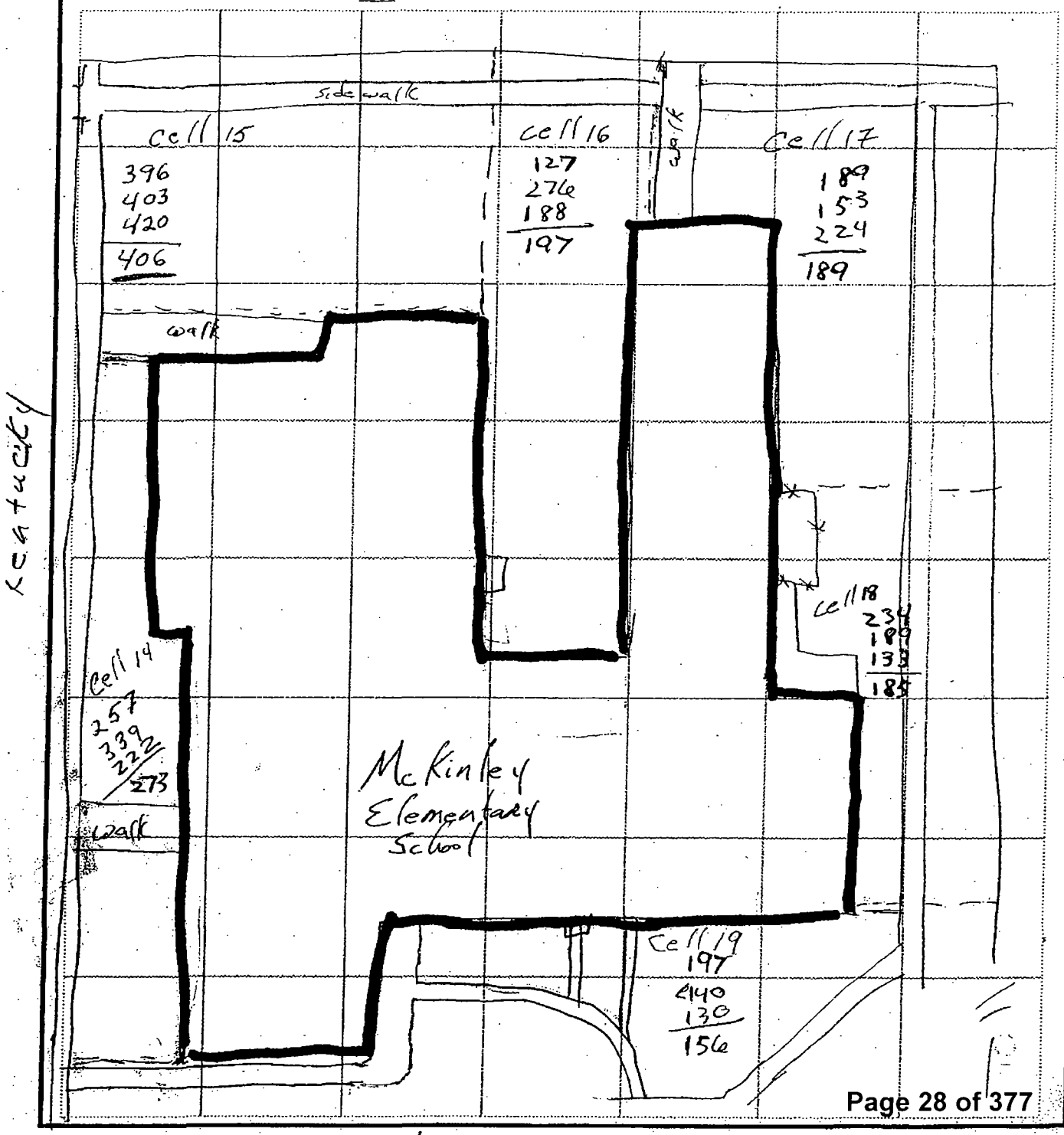
RESIDENTIAL FIELD SCREENING FORMS

United Zinc # 1
Residential Property Screening Form
EPA Site # 2

Date(s): 4/11/06

Name: McKinley Elmen. School
Address: 204 S. Kentucky
Iola, Ks. 66749
Phone #
Owner Information on back:

Screening Results: XRF I.D. 64 Operator RC
Post-Removal:
Latitude N37.91957°
Longitude W-95.39069°



to page 2

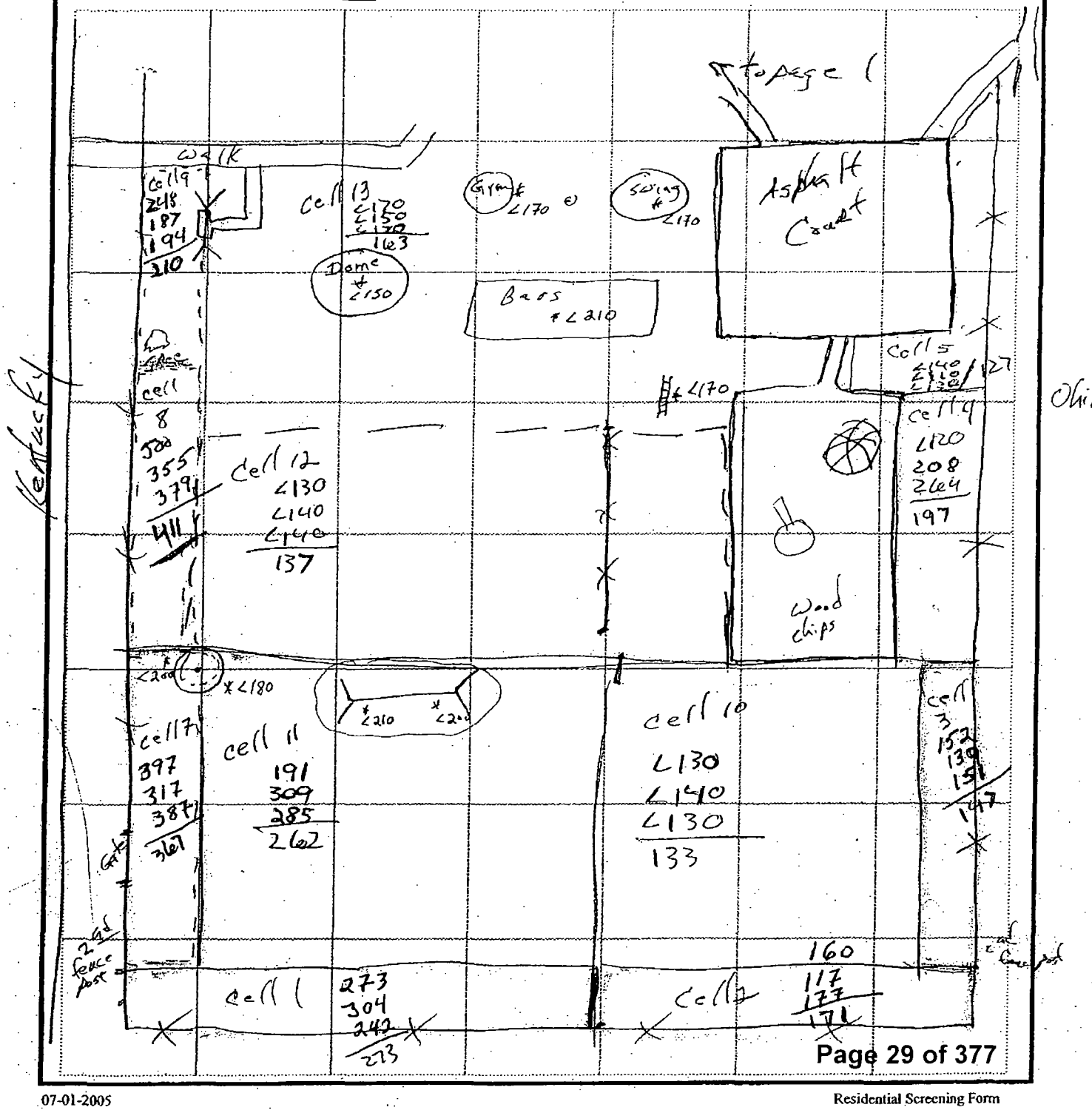
United Zinc # 1
Residential Property Screening Form
EPA Site # 2 (page 2)

Date(s): 4/15/06

Name: McKinley Elem.
Address: 204 S. Kentucky
Iola, Ks. 66749
Phone #
Owner Information on back:

	XRF I.D.	Operator
Screening Results:	64	RC
Post-Removal:		

Latitude
Longitude



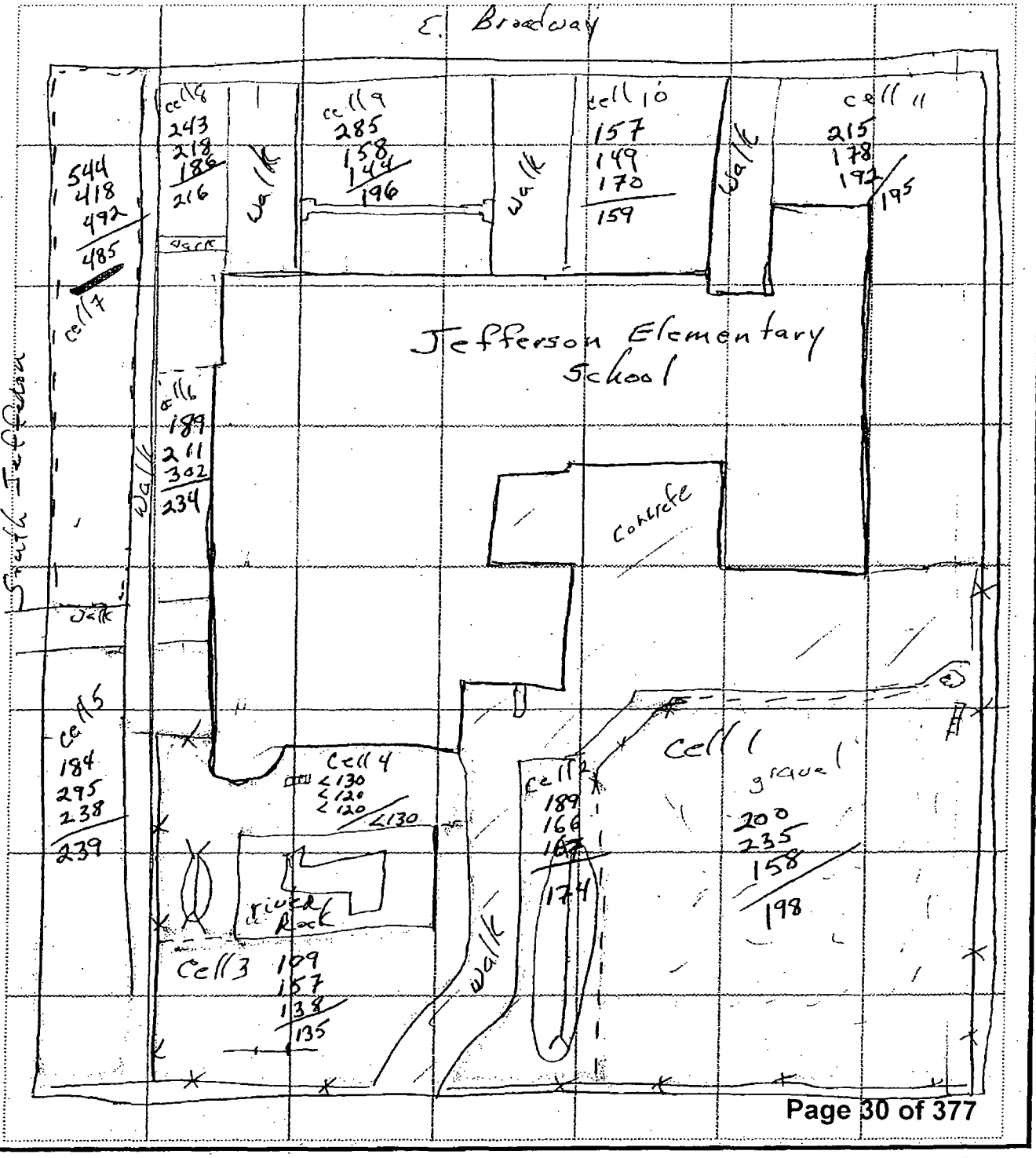
United Zinc # 1
Residential Property Screening Form
EPA Site # 3

Date(s): 4/12/06

	XRF I.D.	Operator
Screening Results:	64	Rc
Post-Removal:		

Name: Jefferson Elem.
Address: 300 S Jefferson
Iola, Ks 66749
Phone #
Owner Information on back:

Latitude N 37° 91975°
Longitude W 95. 40314°

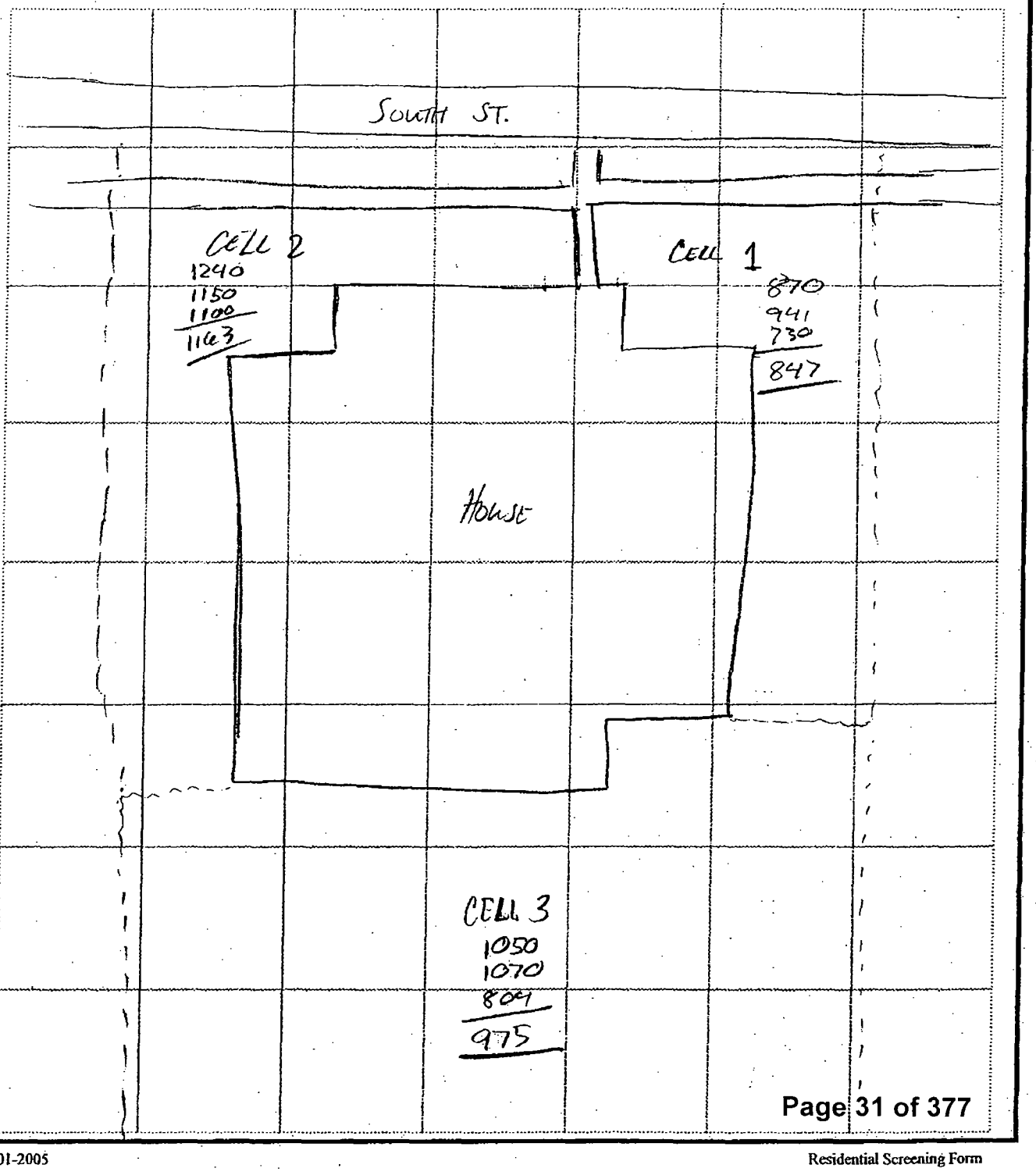


United Zinc # 1
Residential Property Screening Form
EPA Site # 41

Date(s): 4-~~18~~ 19-06 RC

		XRF I.D.	Operator
Name: Barbara Branstetter	Screening Results:	64	RC
Address: 405 South St.	Post-Removal:		
Iola, KS 66749	Latitude N. 37.91866		
Phone # (620) 365-8445	Longitude W 95.40445		

Owner Information on back:___



+ LOL

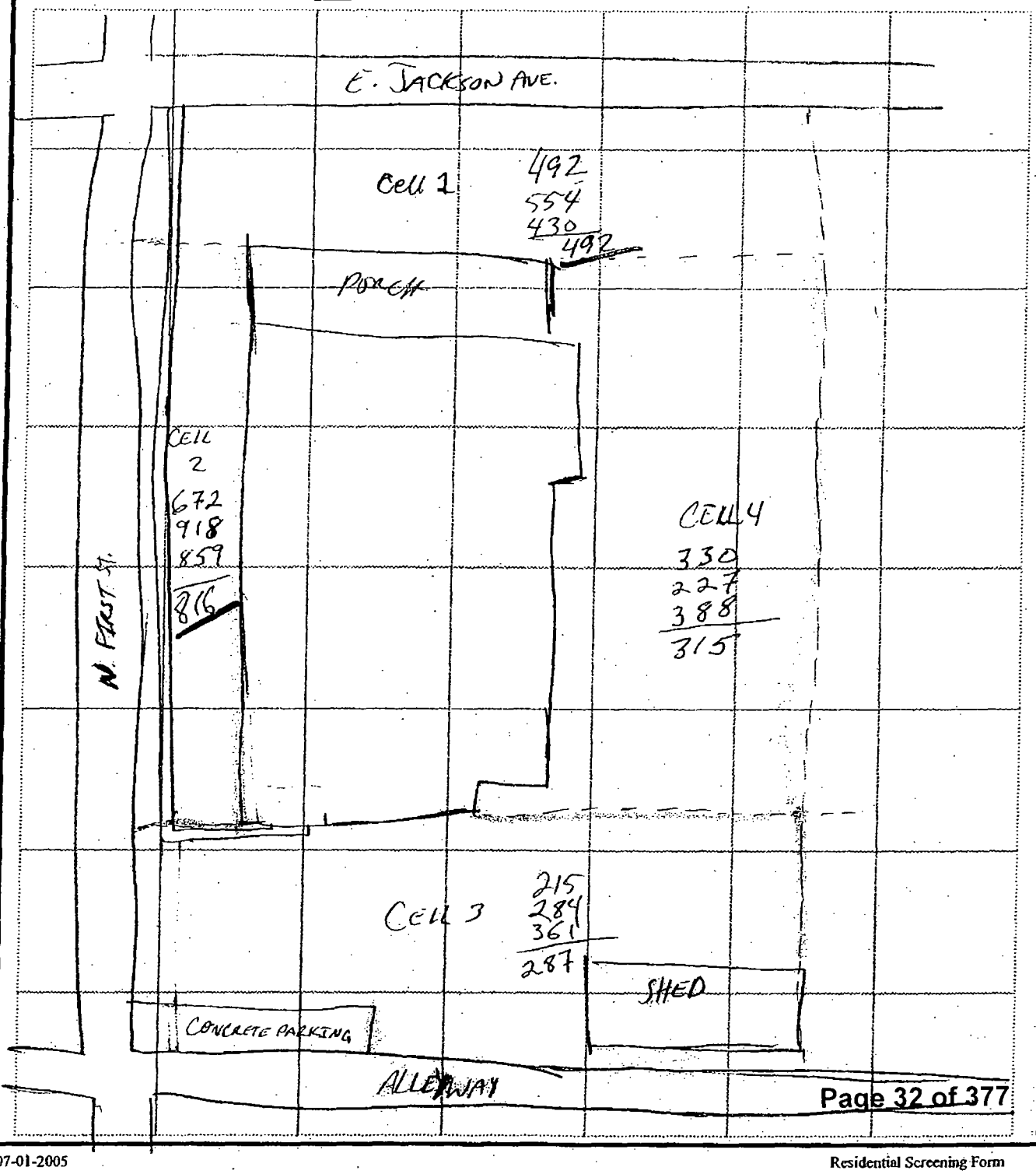
United Zinc # 1
Residential Property Screening Form
EPA Site # 49

Date(s): 4/19/06

Name: Shar Kress
Address: 801 E Jackson
Iola, KS 66749
Phone #(620)-228-1850
Owner Information on back: ___

	XRF I.D.	Operator
Screening Results:	64	AB
Post-Removal:		

Latitude N 37.92250°
Longitude W 95.39489°



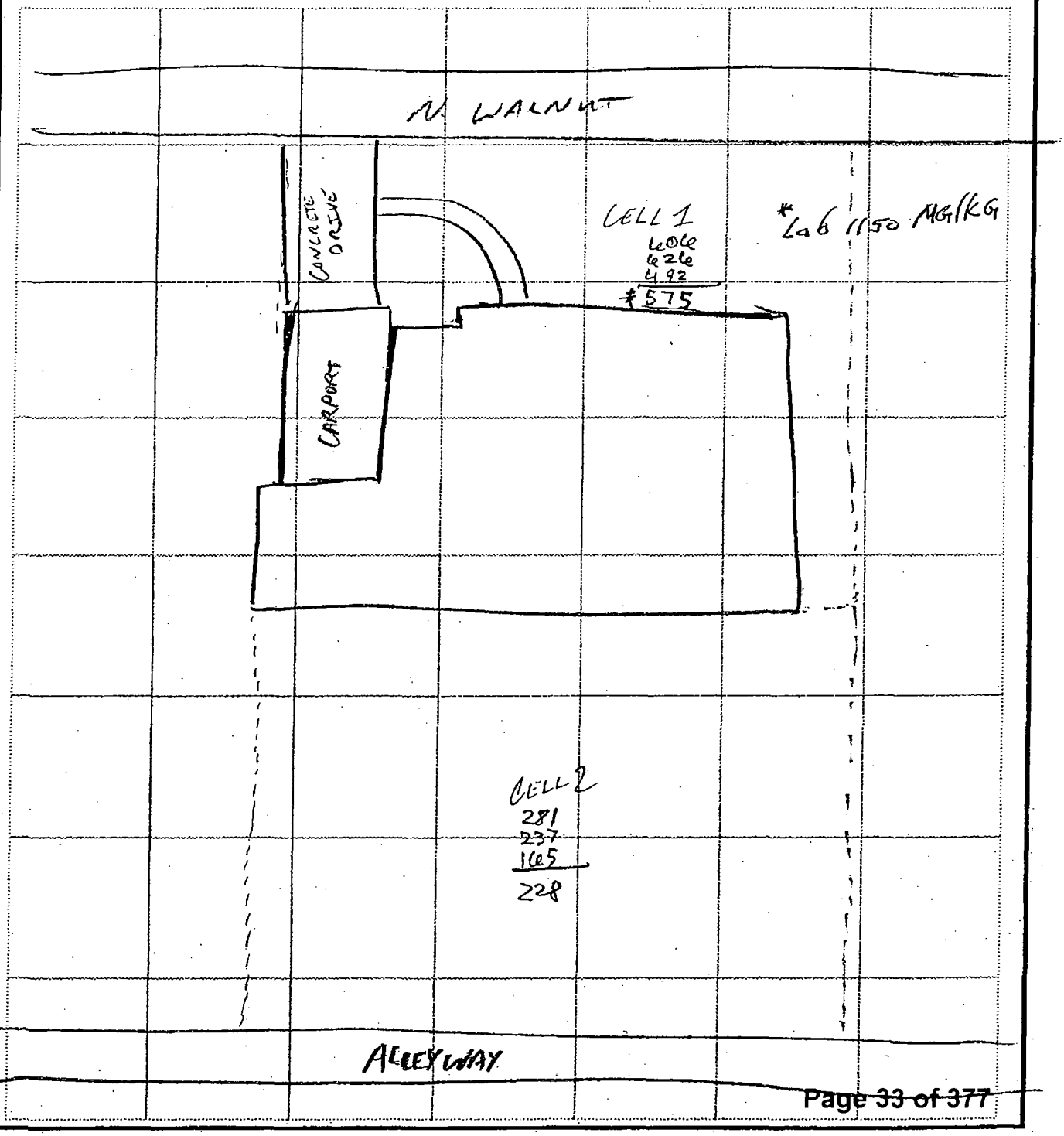
United Zinc # 1
Residential Property Screening Form
EPA Site # 64

Date(s): 4/25/06

	XRF I.D.	Operator
Screening Results:	64	Aff
Post-Removal:		

Name: Joseph M Neal
Address: 910 N. Walnut
Iola, Ks 66749
Phone #(620) 363-0012
Owner Information on back: ___

Latitude N 37.9066°
Longitude W 95.40673°



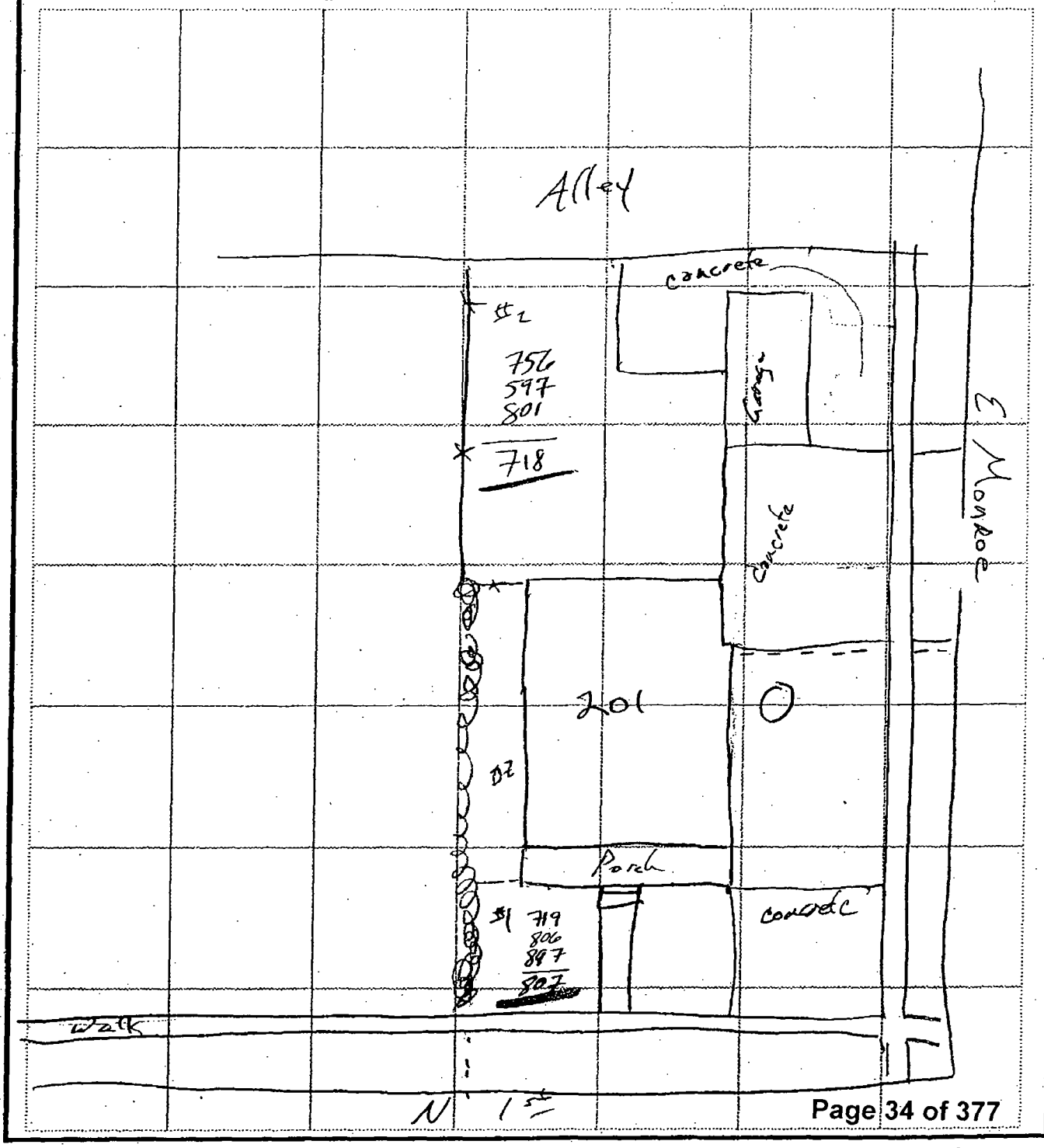
United Zinc # 1
Residential Property Screening Form
EPA Site # 65

Date(s): 4/26/06

Name: Darius Bell
Address: 201 N. 1st
Iola, KS 66749
Phone #(620) 365-6665
Owner Information on back: ___

	XRF I.D.	Operator
Screening Results:	64	AB
Post-Removal:		

Latitude N 37.92429
Longitude W 95.39526



Y 20

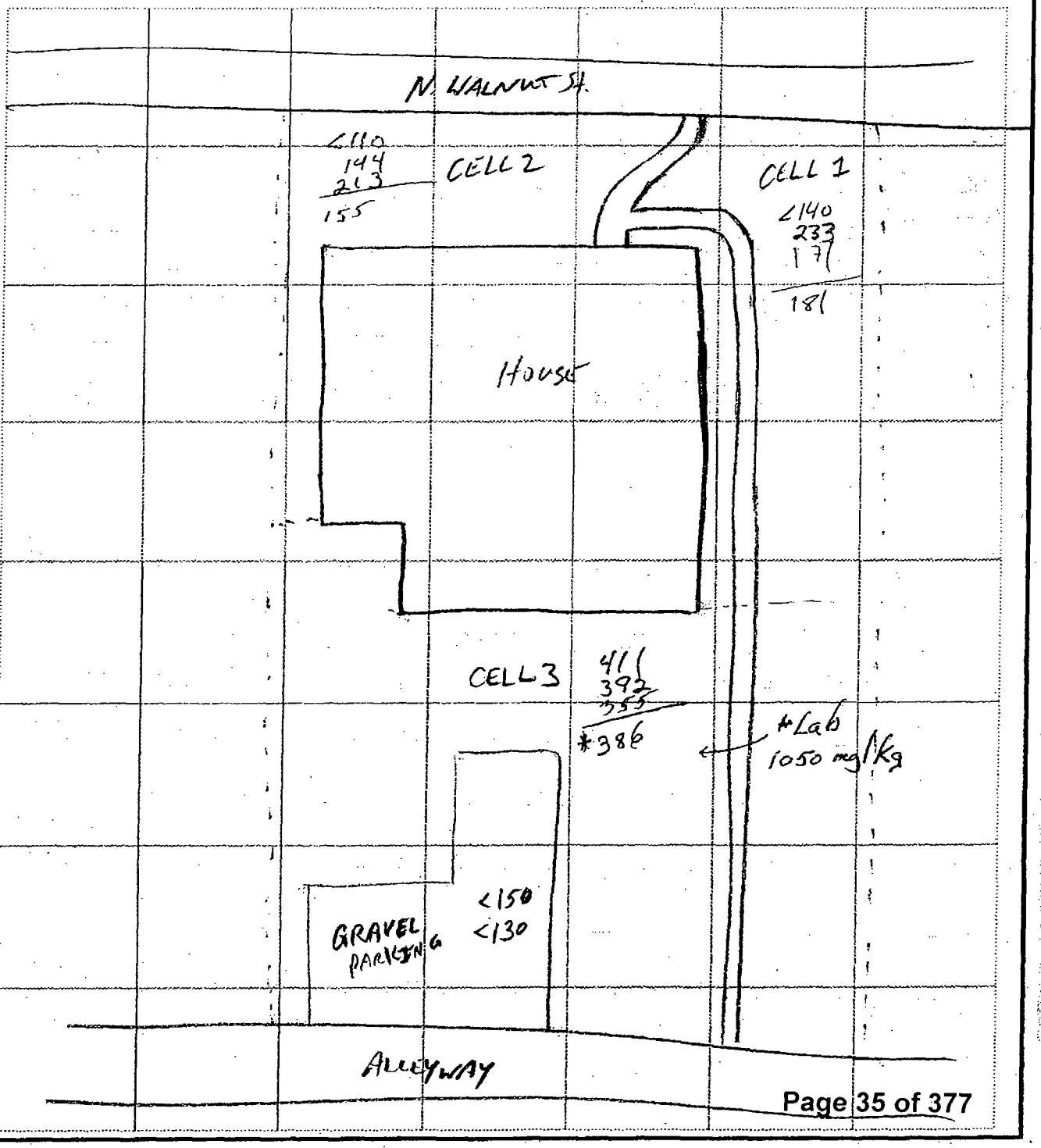
United Zinc # 1
Residential Property Screening Form
EPA Site # 76

Date(s): 4/25/06

	XRF I.D.	Operator
Screening Results:	64	RC
Post-Removal:		

Name: Chelsie Tomlinson
Address: 812 N. Walnut
Iola, KS 66749
Phone # 620-431-7268
Owner Information on back: X

Latitude N 37. 92984
Longitude W. 95. 40676



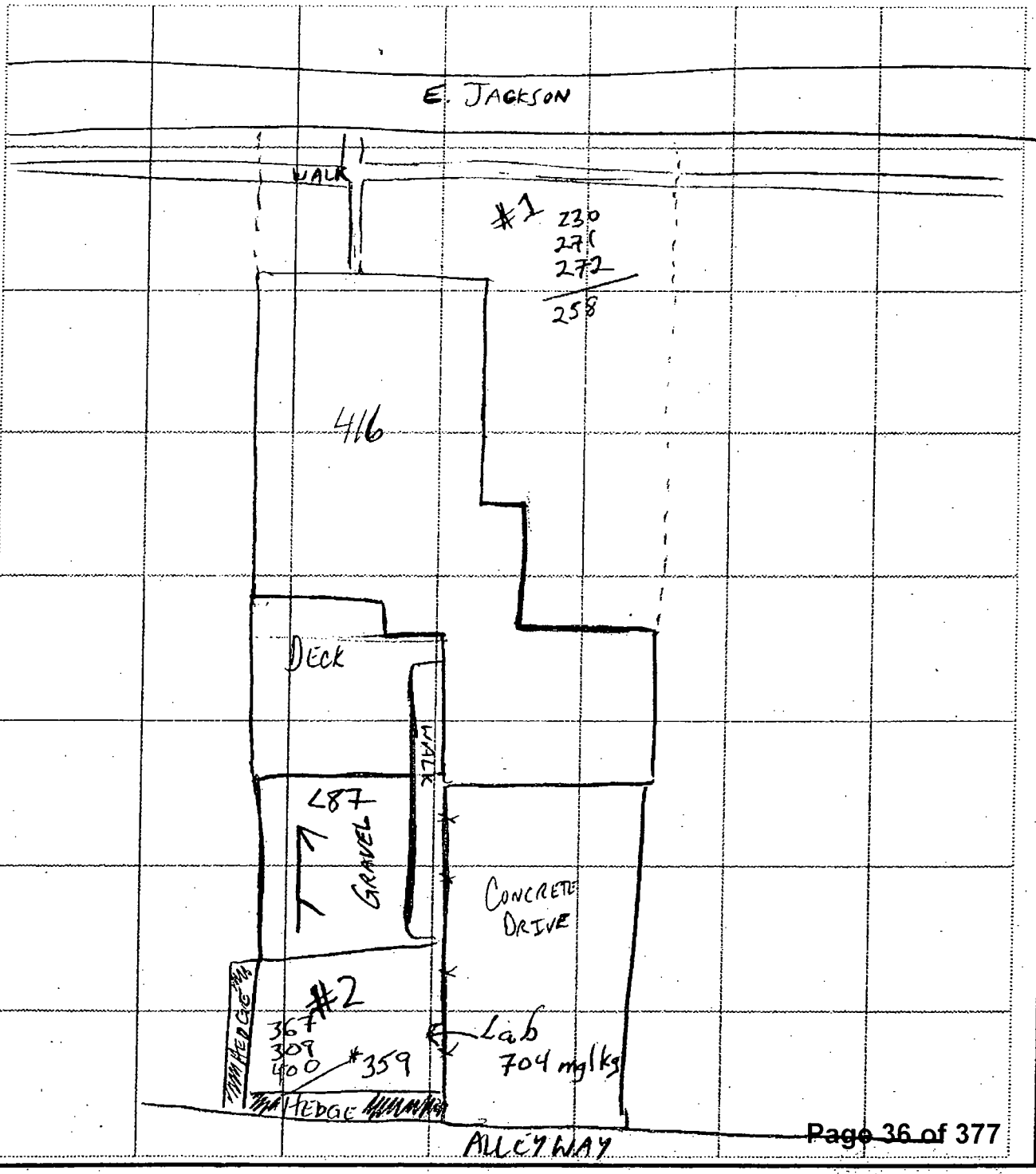
United Zinc # 1
Residential Property Screening Form
EPA Site # 102

Date(s): 4-27-06

	XRF I.D.	Operator
Screening Results:	64	RC
Post-Removal:		

Name: Tersa Cook
Address: 416 E. Jackson
Tola, Ks. 66749
Phone # 620-228-1937
Owner Information on back: ___

Latitude N 37.92319°
Longitude W 95.39898°



United Zinc # 1
Residential Property Screening Form
EPA Site # 183

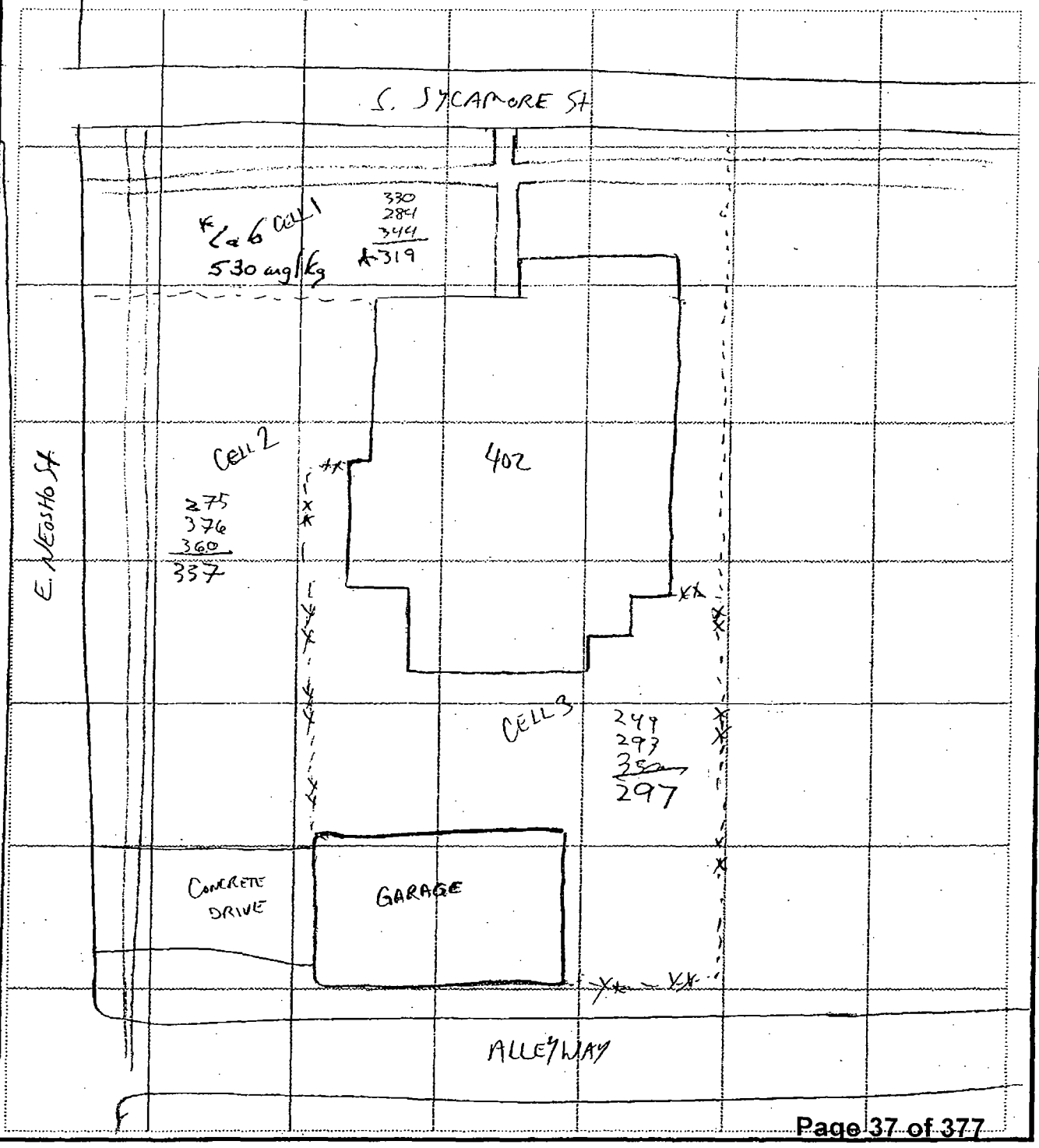
Date(s): 5-8-06

	XRF I.D.	Operator
Screening Results:	64	AA
Post-Removal:		

Name: BRIAN & TINA DONOVAN
Address: 402 S. SYCAMORE
IOLA, KS 66749
Phone # (620) 365-2967

Latitude N 37.91877°
Longitude W 95.40221°

Owner Information on back: ___



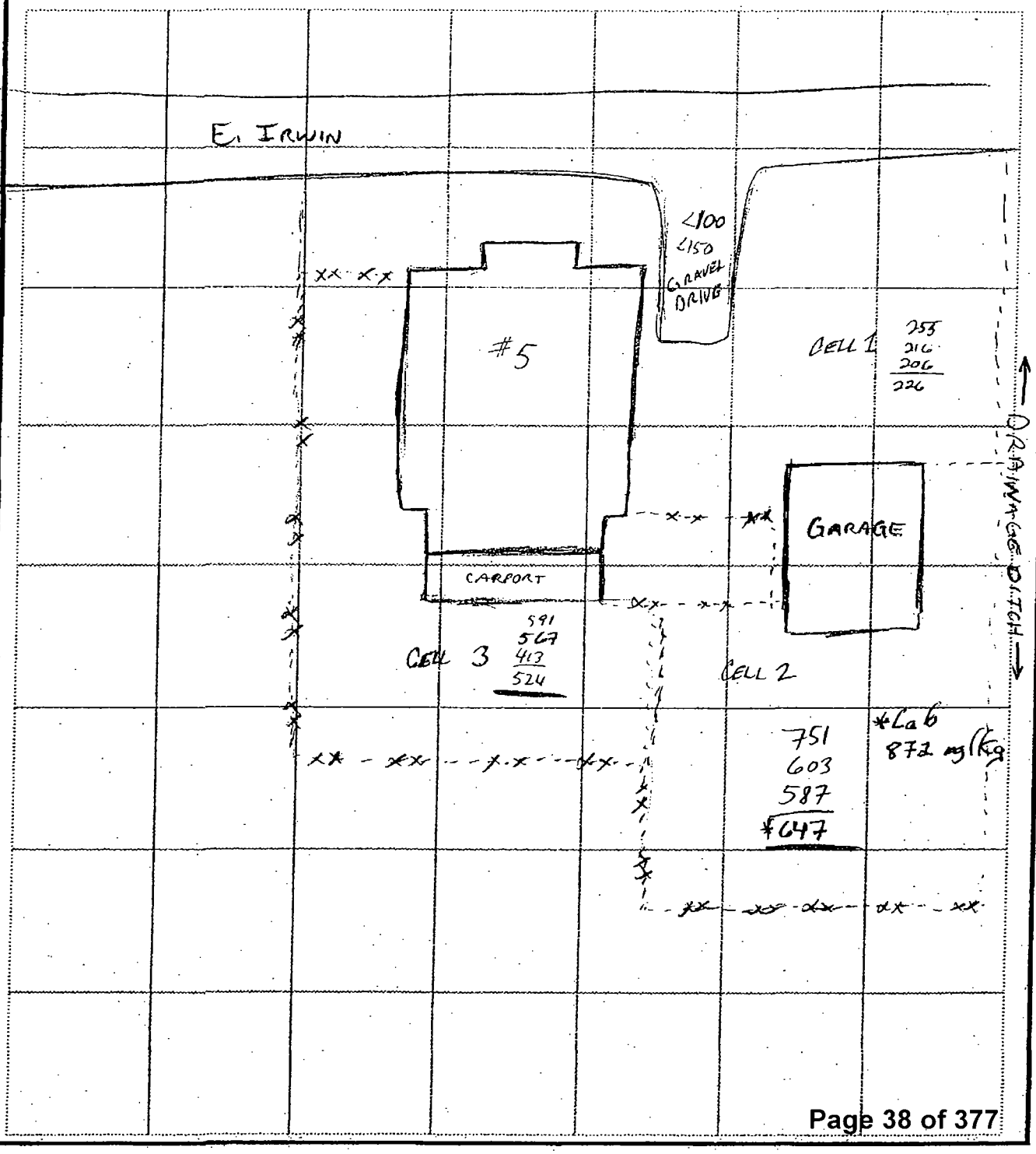
United Zinc # 1
Residential Property Screening Form
EPA Site # 234

Date(s): 5-16-06

	XRF I.D.	Operator
Screening Results:	64	
Post-Removal:		

Name: Larry L. Charning
Address: 5 E. Irwin
Iola, Ks 66749
Phone #(620) 363-3115
Owner Information on back: ___

Latitude N 37.91490
Longitude W 95.4041



United Zinc # 1
Residential Property Screening Form
EPA Site # 254

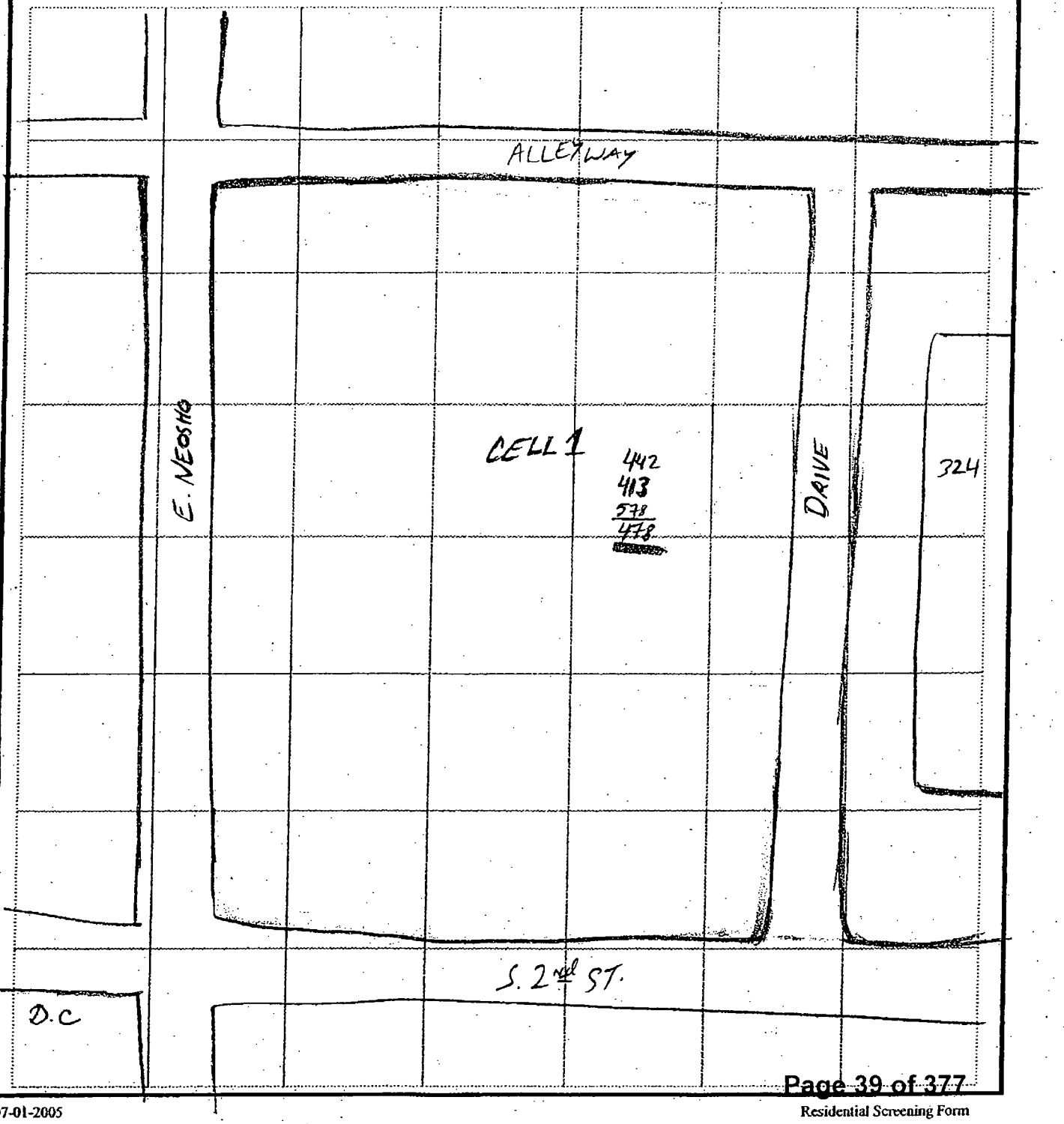
Date(s): 5-17-06

DC

Name: Amy Shields
Address: 326 S. 2nd
Iola, KS 66749
Phone # (620) 365-6292
Owner Information on back: Y

	XRF I.D.	Operator
Screening Results:	64	RC
Post-Removal:		

Latitude N 37.91885°
Longitude W 95.39403°



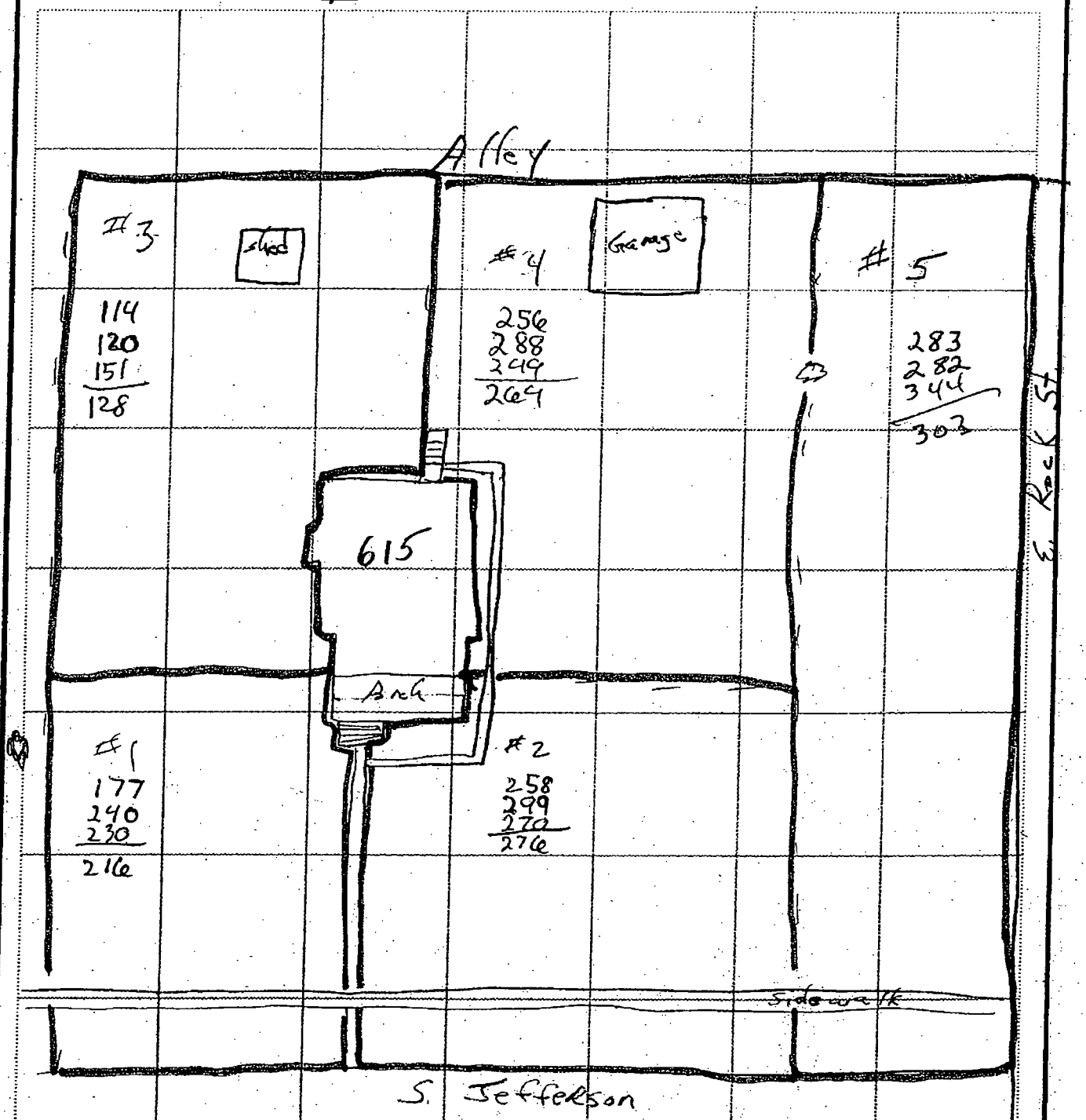
United Zinc # 1
Residential Property Screening Form
EPA Site # 260

Date(s): 8/9/08

Name: Martin Taylor
Address: 615 S. Jefferson
Iola, KS 66749
Phone # 620-365-2052
Owner Information on back: X

	XRF I.D.	Operator
Screening Results:	58	RC
Post-Removal:		

Latitude N 37.91624°
Longitude W 95.40340°



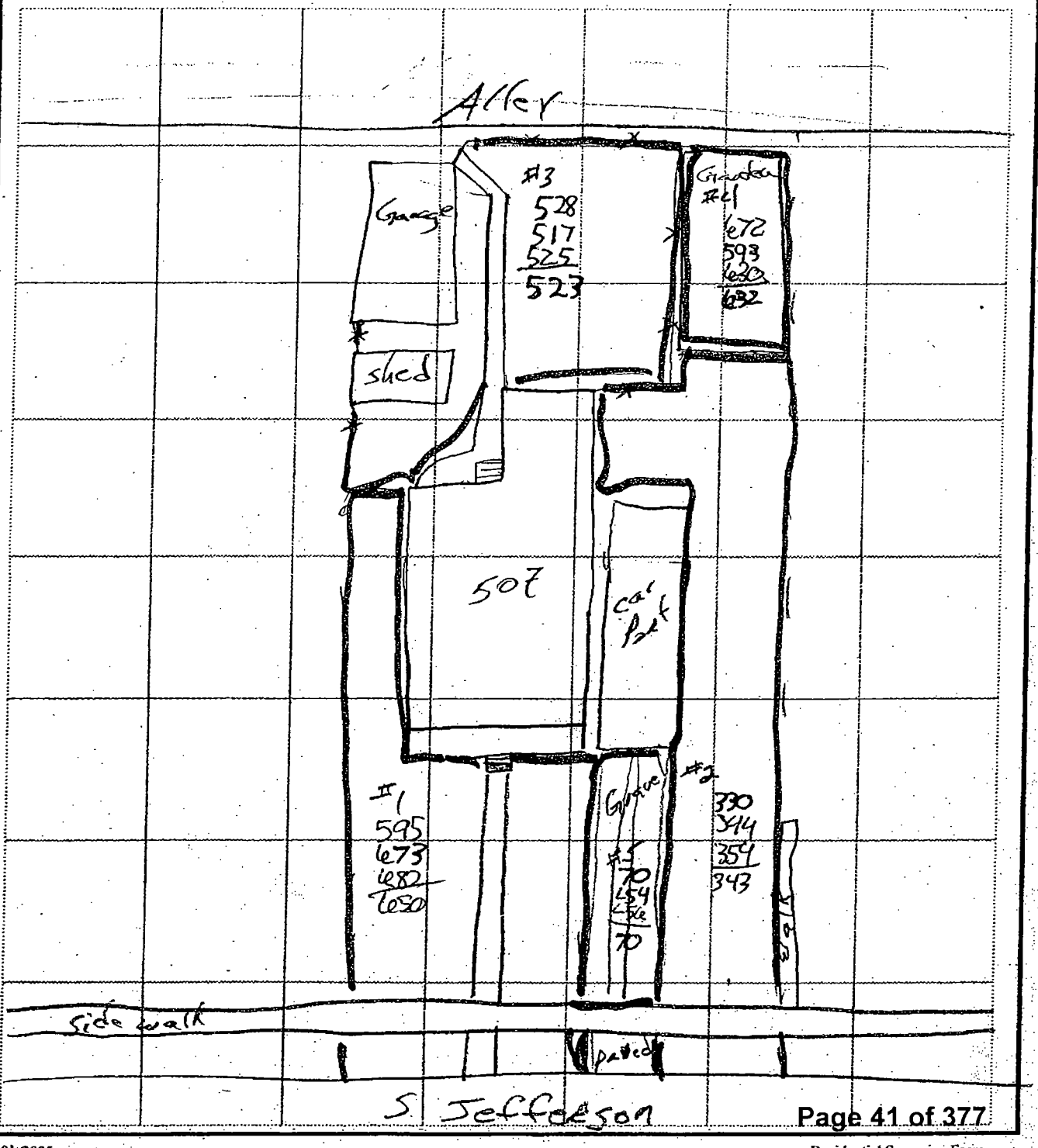
United Zinc # 1
Residential Property Screening Form
EPA Site # 261

Date(s): 8/9/06

Name: Billy Caudell
Address: 507 S. Jefferson
Iola, KS 66749
Phone # 620-365-3874
Owner Information on back: ___

	XRF I.D.	Operator
Screening Results:	58	RC
Post-Removal:		

Latitude N. 37.91752
Longitude W 94.40343



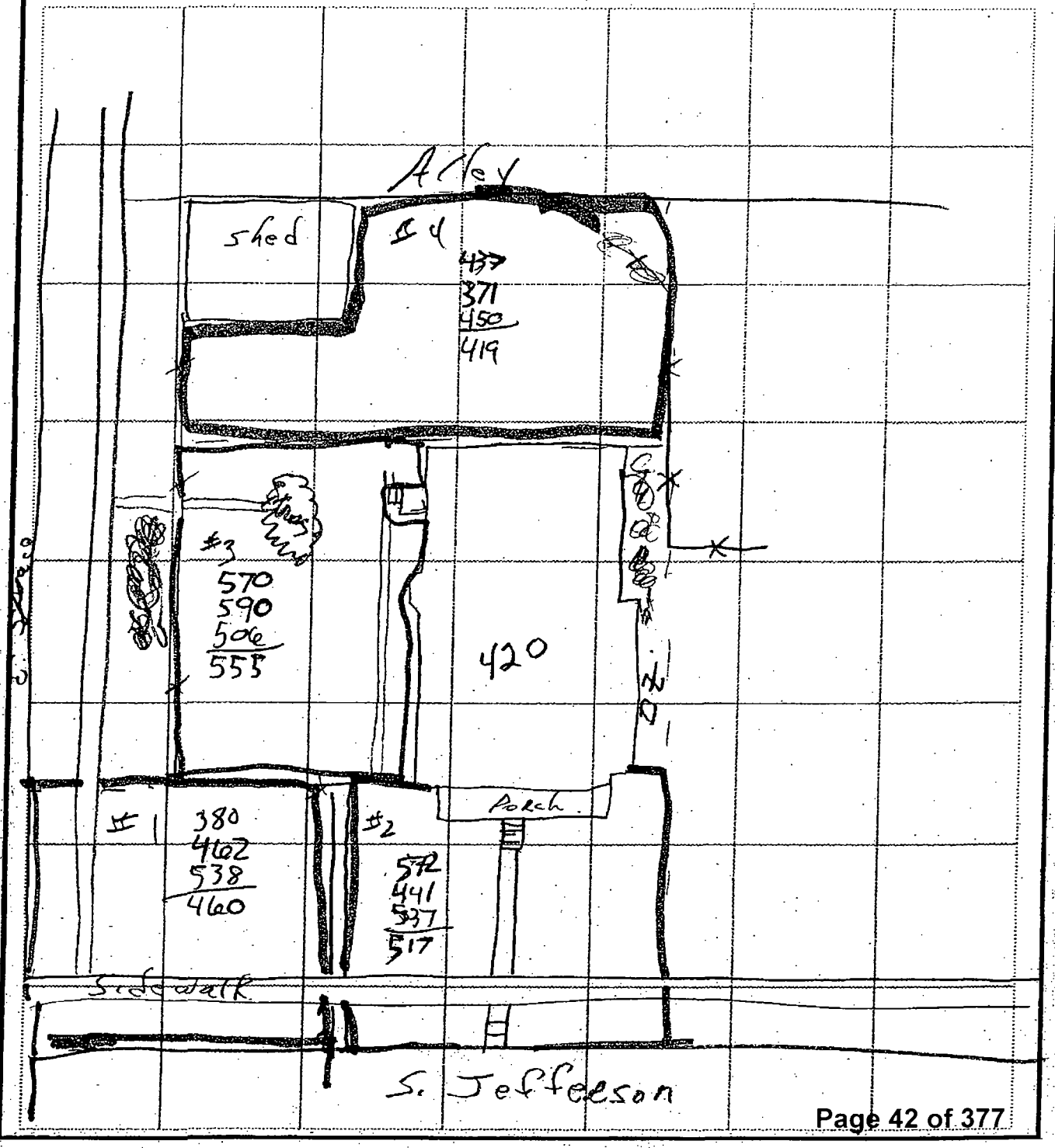
United Zinc # 1
Residential Property Screening Form
EPA Site # 262

Date(s): 8/9/06

Name: John Lucas
Address: 420 S. Jefferson
Iola, Ks 66749
Phone # 620-365-0186
Owner Information on back: ___

	XRF I.D.	Operator
Screening Results:	58	Rc
Post-Removal:		

Latitude N 37.91831
Longitude W 95.40349



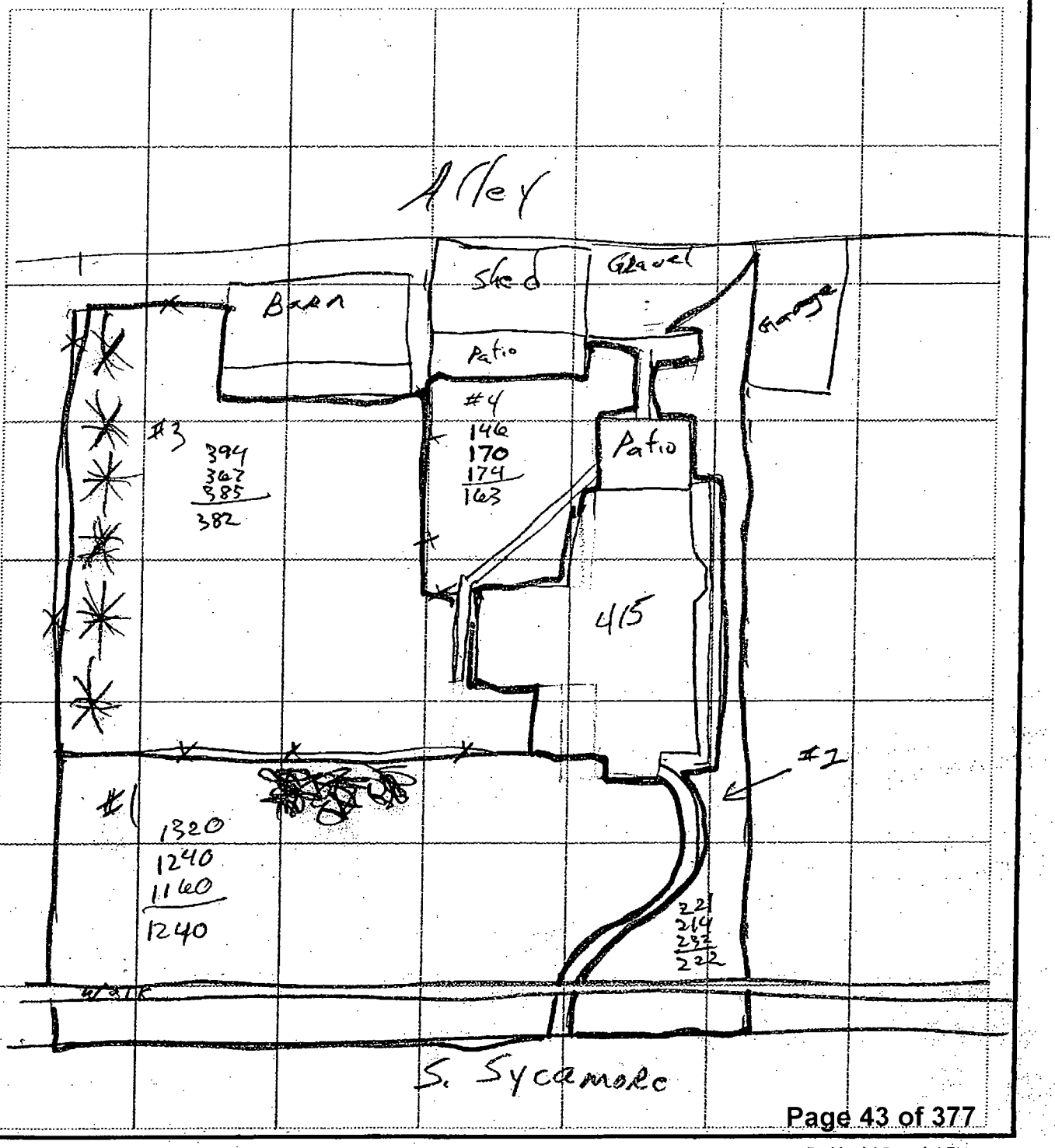
United Zinc # 1
Residential Property Screening Form
EPA Site # 266

Date(s): 8/9/06

Name: Ralph Smith
Address: 415 S. Sycamore
Iola, Ks 66749
Phone # 620-365-6245
Owner Information on back: ___

	XRF I.D.	Operator
Screening Results:	#58	AH
Post-Removal:		

Latitude N 37.91827
Longitude W 95.40210



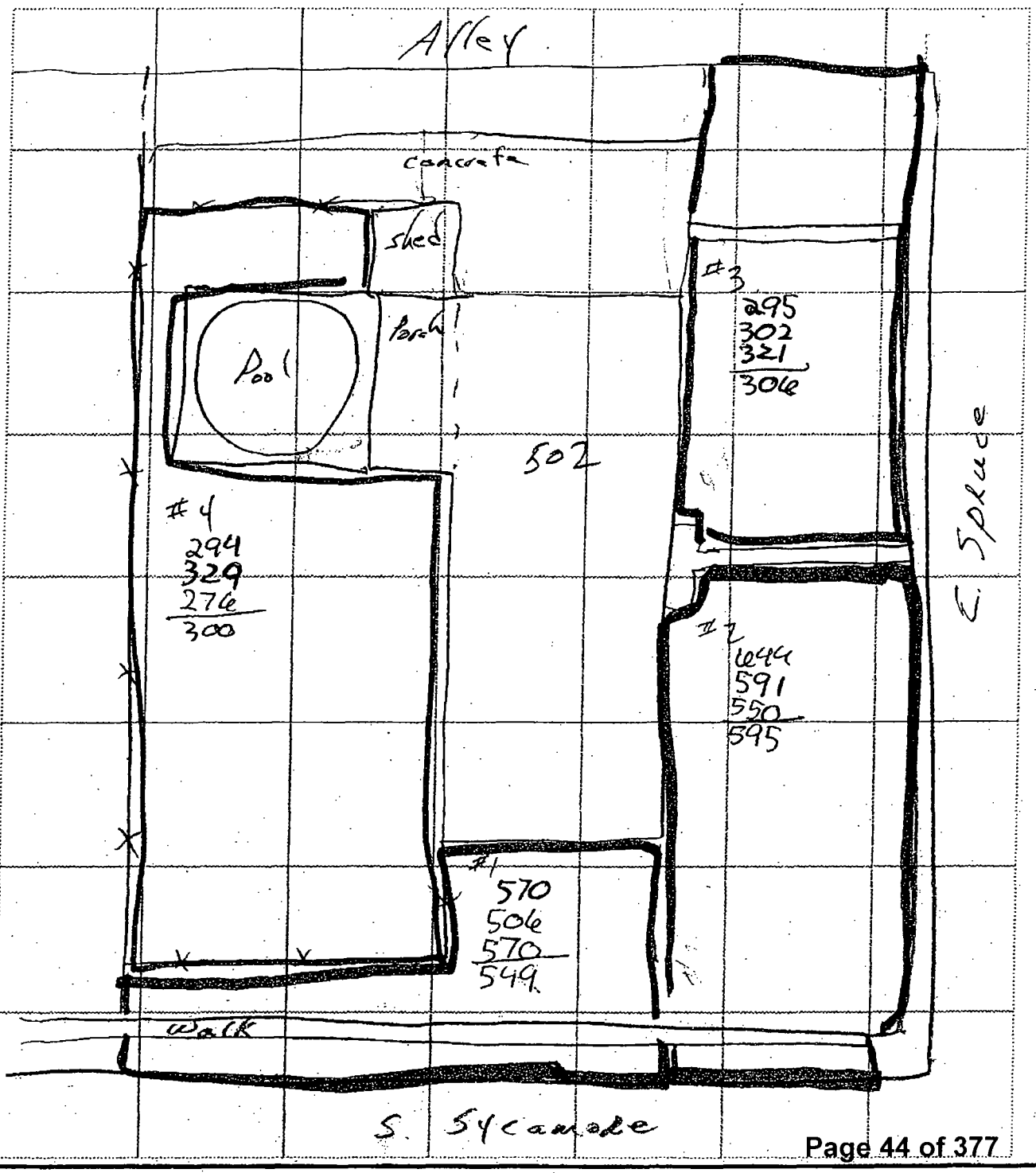
United Zinc # 1
Residential Property Screening Form
EPA Site # 268

Date(s): 8/9/06

Name: Jan Sigg
Address: 502 S. Sycamore
Iola, KS 66749
Phone # 620-365-3897
Owner Information on back: ___

	XRF I.D.	Operator
Screening Results:	58	RC
Post-Removal:		

Latitude N 37.91756°
Longitude W 95.40220°



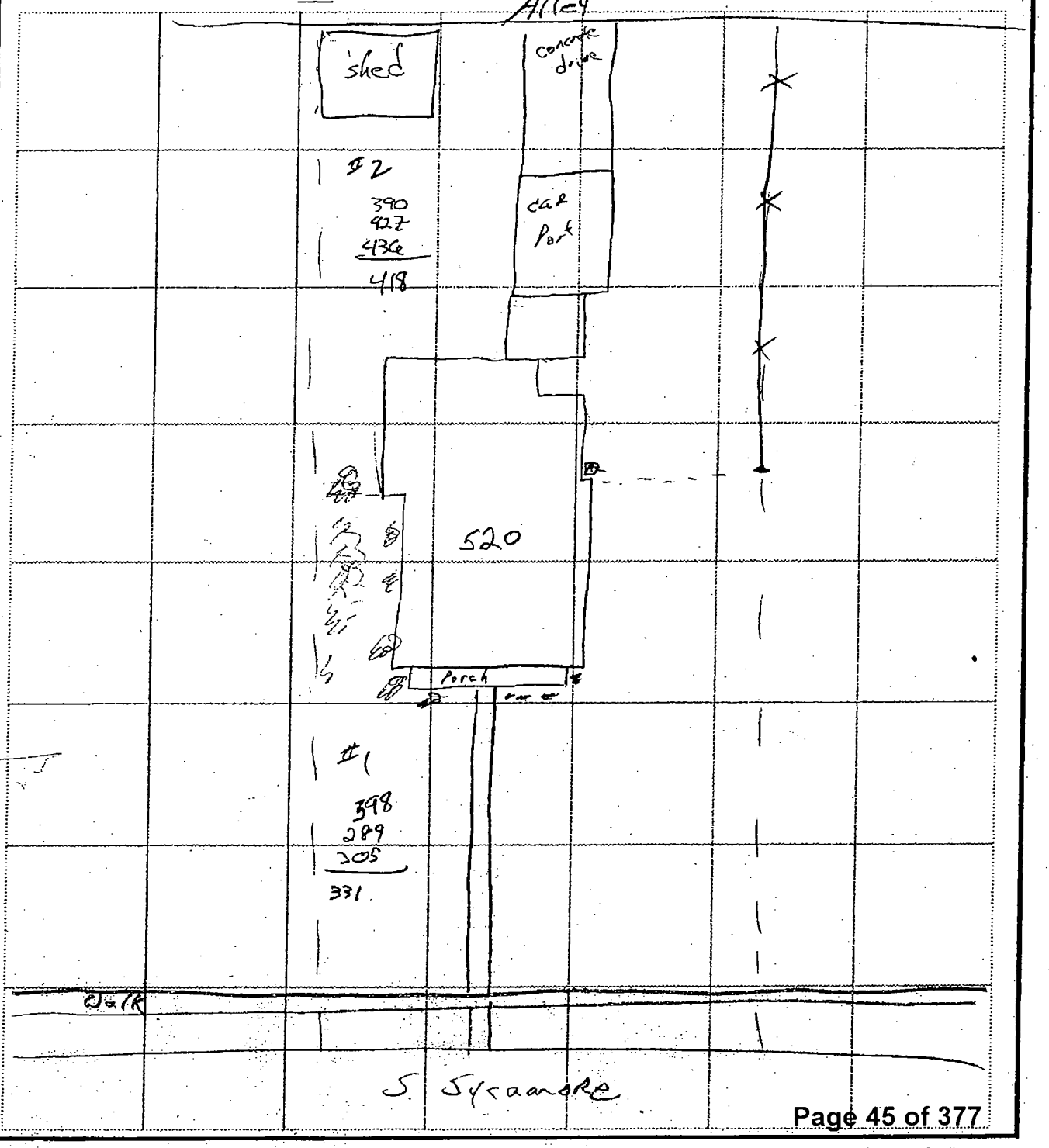
United Zinc # 1
Residential Property Screening Form
EPA Site # 270

Date(s): 8/14/06

	XRF I.D.	Operator
Screening Results:	58	AH
Post-Removal:		

Name: Margaret Raines
Address: 520 S. Sycamore
Iola, KS 66749
Phone # 620-365-3265
Owner Information on back: ___

Latitude N 37.9176°
Longitude W 95.40227°



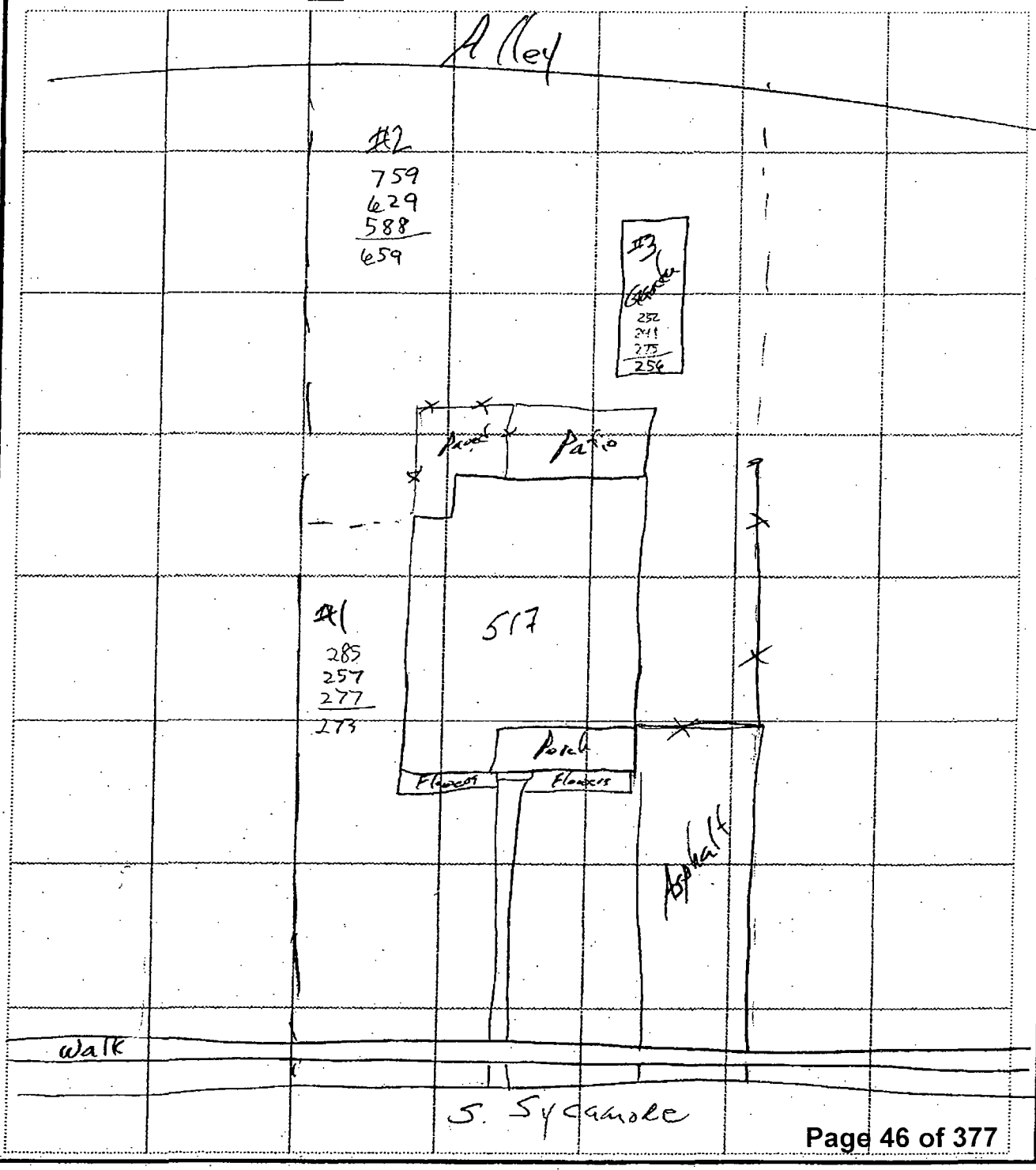
United Zinc # 1
Residential Property Screening Form
EPA Site # 285

Date(s): 8/21/06

	XRF I.D.	Operator
Screening Results:	58	
Post-Removal:		

Name: Thomas H. Wall
Address: 517 S. Sycamore
Iola, Ks 66749
Phone # 620-365-5947
Owner Information on back: ___

Latitude N 37.91713°
Longitude W 95.40218°



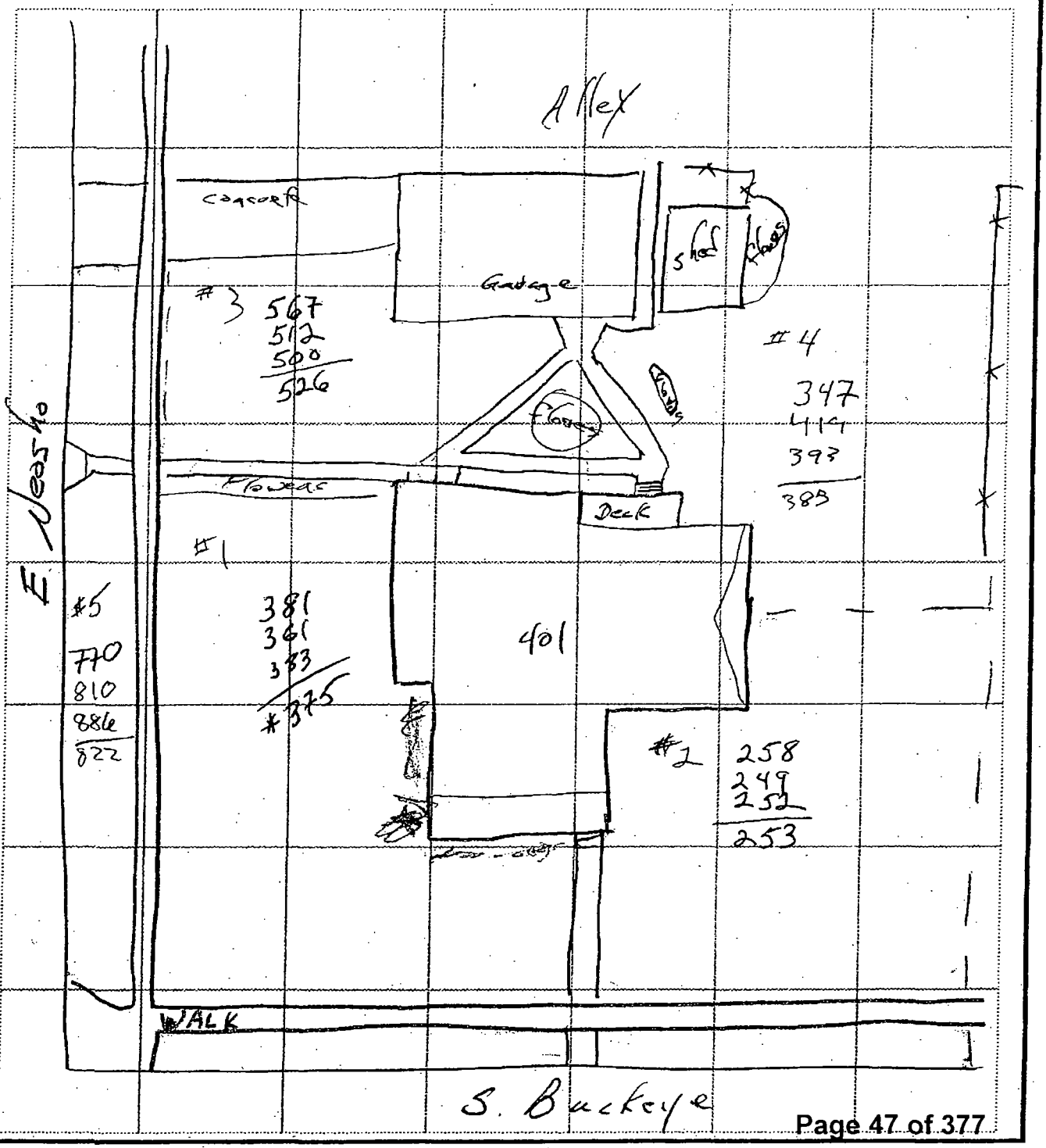
United Zinc # 1
Residential Property Screening Form
EPA Site # 281

Date(s): 8/28/06

Name: Herb Wilson
Address: 401 S. Buckeye
Iola, Ks 66749
Phone # 620-365-2129
Owner Information on back: ___

	XRF I.D.	Operator
Screening Results:	58	RC
Post-Removal:		

Latitude N37.91879°
Longitude W95.40097°



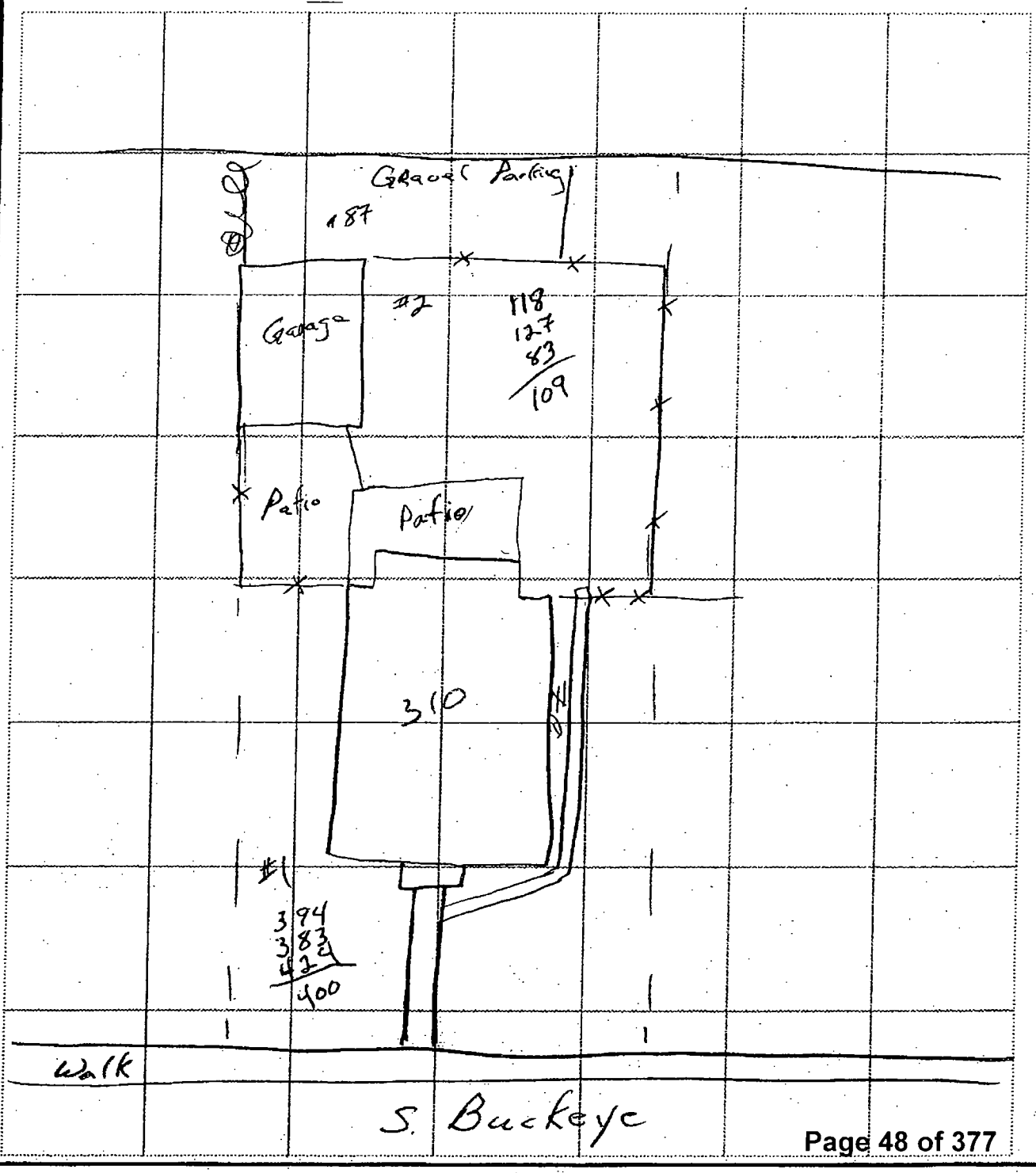
United Zinc # 1
Residential Property Screening Form
EPA Site # 287

Date(s): 8/25/06

Name: Donna Brownfield
Address: 310 S. Buckeye
Iola, KS 66749
Phone # 620-365-2329
Owner Information on back: ___

	XRF I.D.	Operator
Screening Results:	58	RC
Post-Removal:		

Latitude ___
Longitude ___



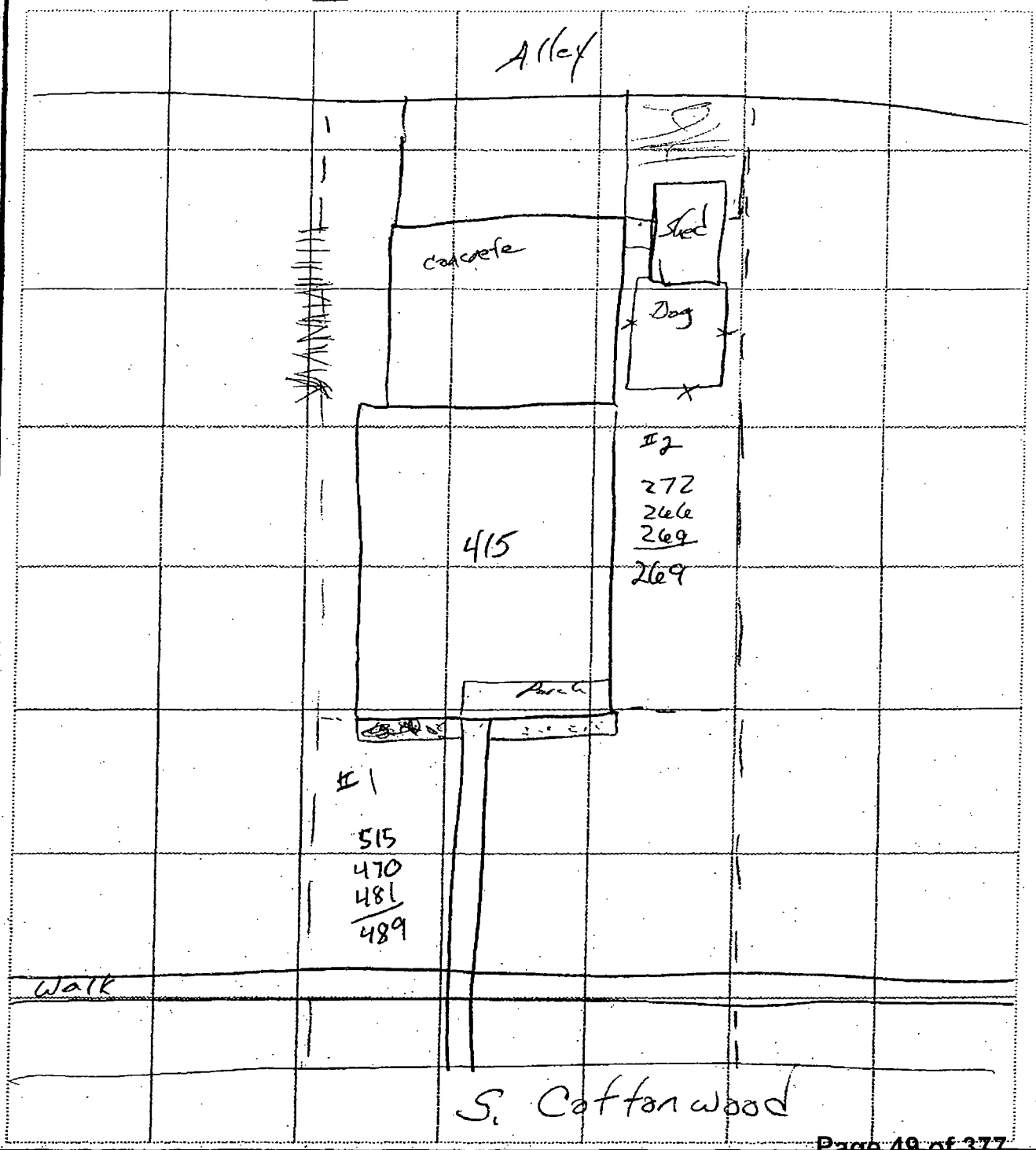
United Zinc # 1
Residential Property Screening Form
EPA Site # 294

Date(s): 8/30/06

Name: Tina Valentine
Address: 415 S. Cottonwood
Iola, Ks 66749
Phone # 620-365-8750
Owner Information on back: ___

	XRF I.D.	Operator
Screening Results:	58	AH
Post-Removal:		

Latitude N 37.91829
Longitude W 95.39986



United Zinc # 1
Residential Property Screening Form
EPA Site # 295

Date(s): 8/22/06

	XRF I.D.	Operator
Screening Results:	58	RC
Post-Removal:		

Name:

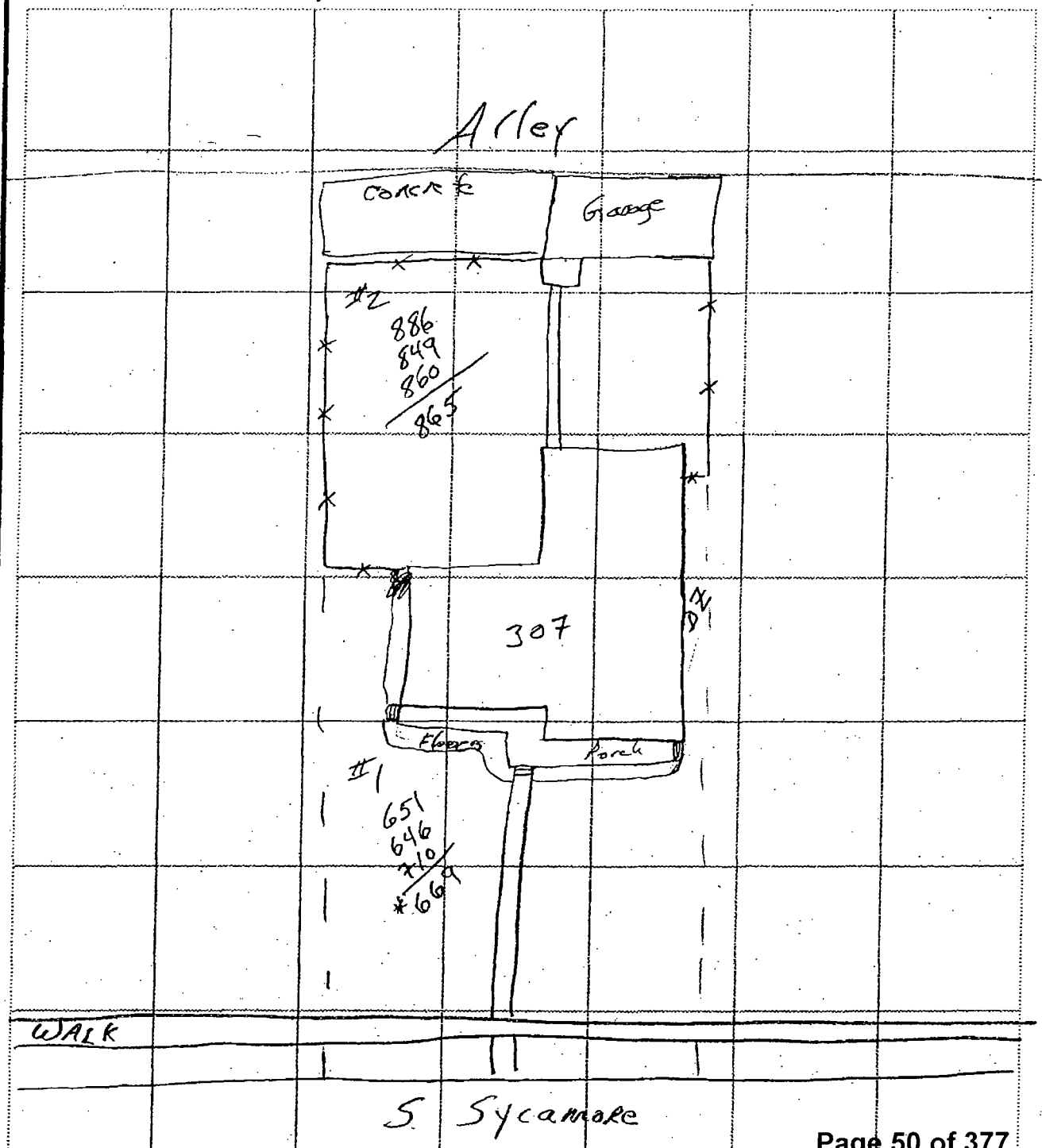
Address: 307 S. Sycamore
Iola, Ks 66749

Phone #

Owner Information on back: X

Latitude

Longitude



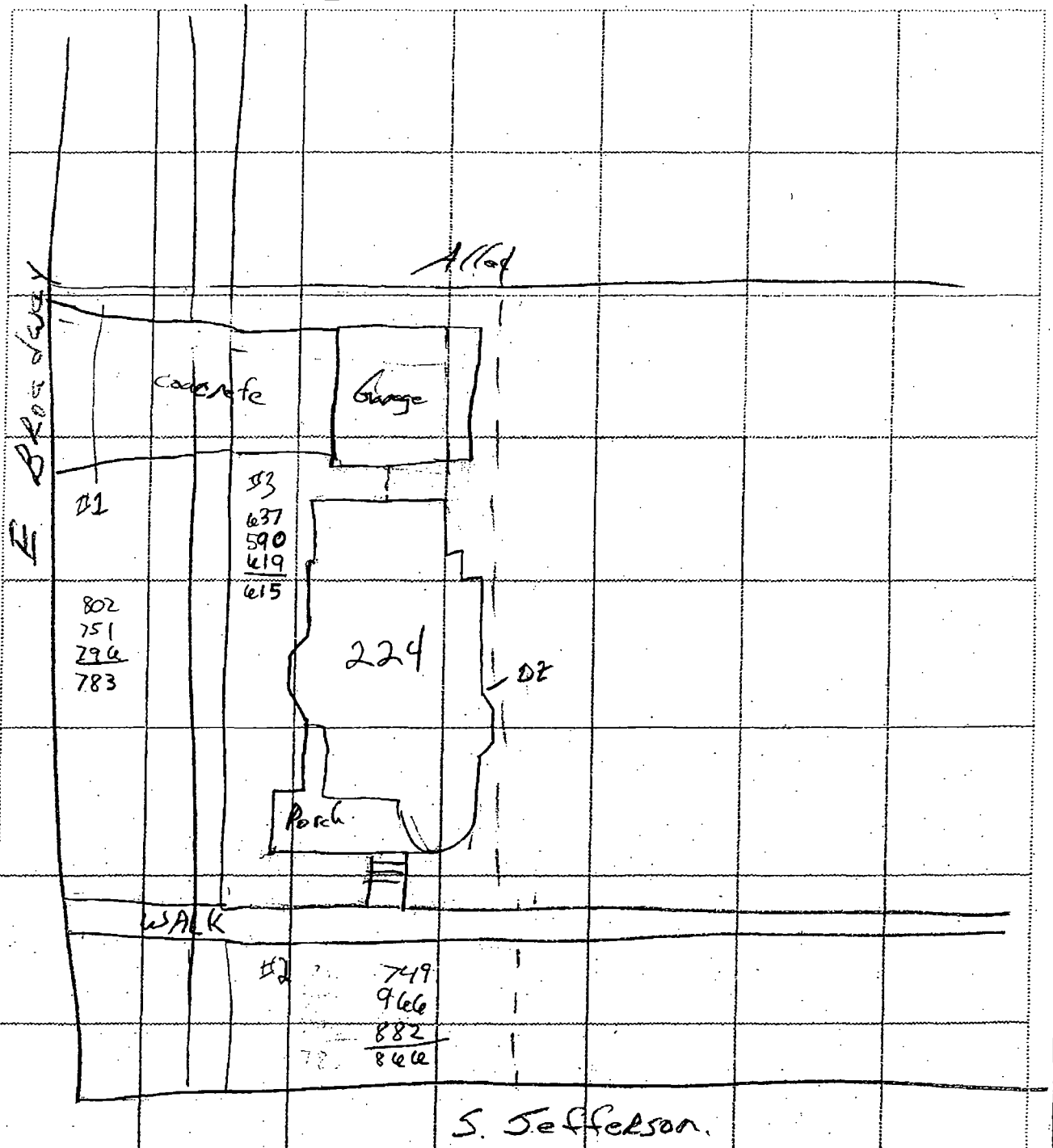
United Zinc # 1
Residential Property Screening Form
EPA Site # 297

Date(s): 8/23/06

	XRF I.D.	Operator
Screening Results:	58	RC
Post-Removal:		

Name: Mary Gengler
Address: 224 S. Jefferson
Iola, KS 66749
Phone # 620-365-5458
Owner Information on back: ___

Latitude ___
Longitude ___



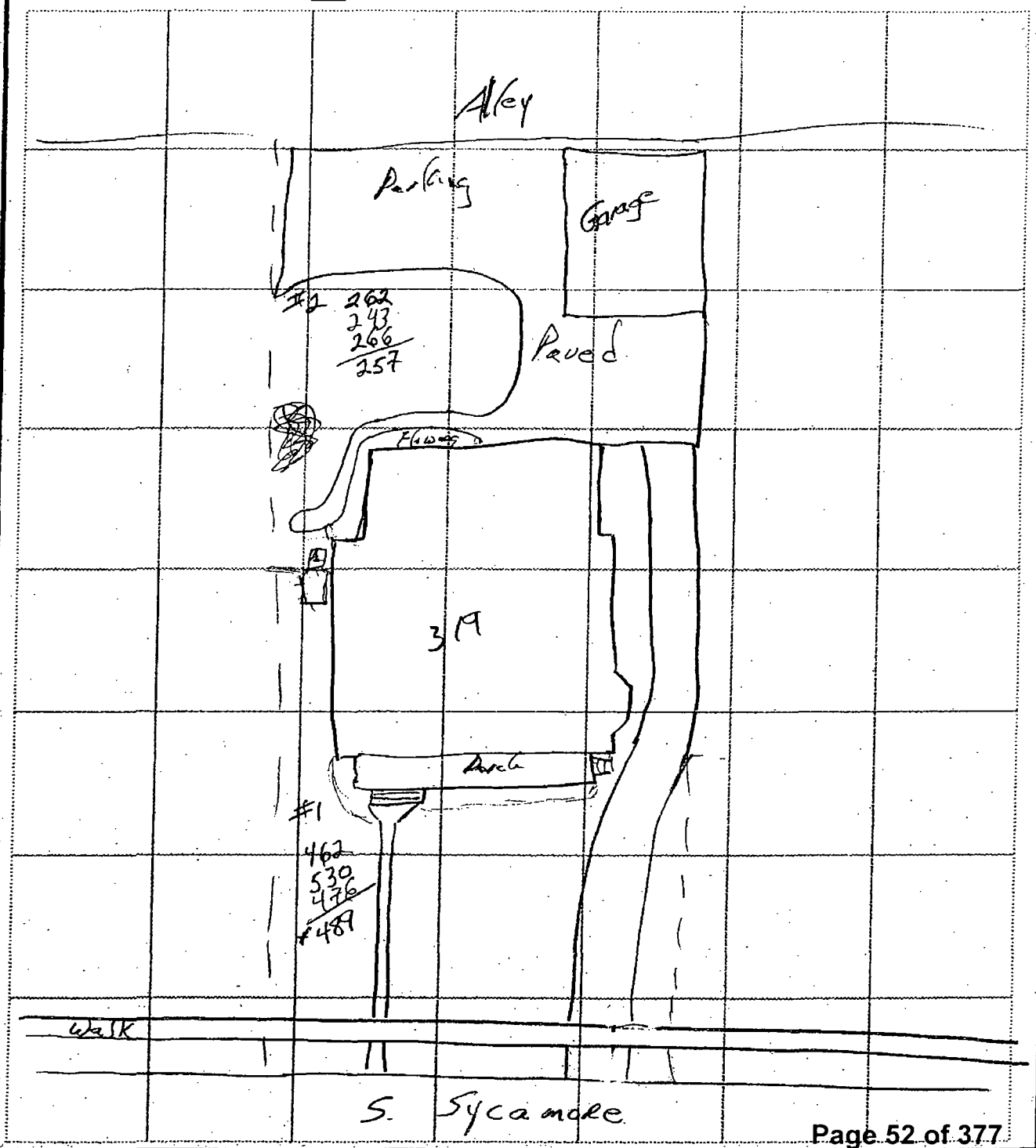
United Zinc # 1
Residential Property Screening Form
EPA Site # 298

Date(s): 8/22/06

Name: Charles E. Kresc
Address: 319 S. Sycamore
Ida, Ks 66749
Phone # 620-365-7023
Owner Information on back: ___

	XRF I.D.	Operator
Screening Results:	58	RC
Post-Removal:		

Latitude N 37.91927°
Longitude W 95.40224°



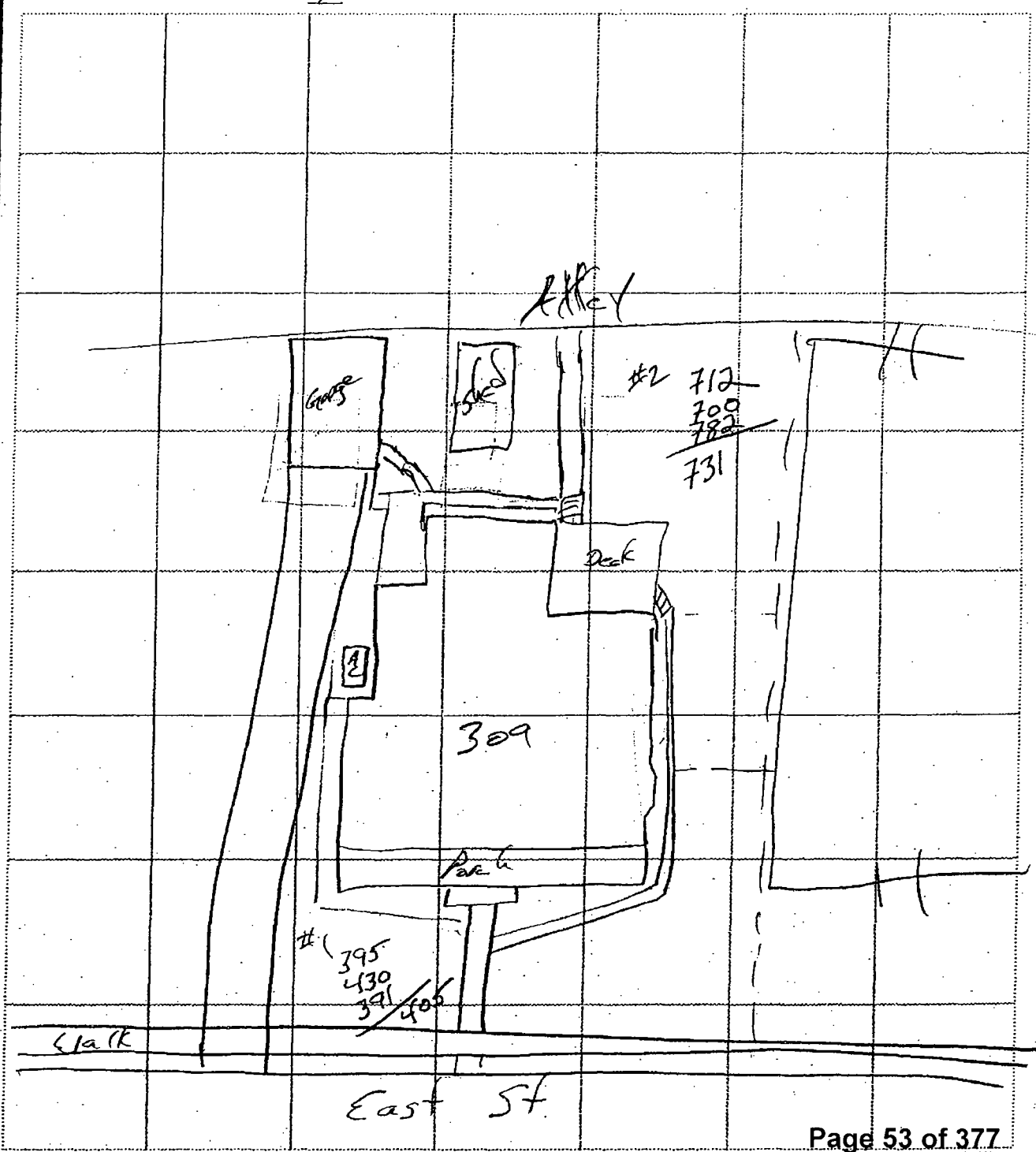
United Zinc # 1
Residential Property Screening Form
EPA Site # 299

Date(s): 8/24/06

Name: Rev. James B. Rausch
Address: 309 East St
Iola, Ks 66749
Phone # 620-365-6244
Owner Information on back: X

	XRF I.D.	Operator
Screening Results:	58	AH
Post-Removal:		

Latitude N 37.93330°
Longitude W 95.40012°

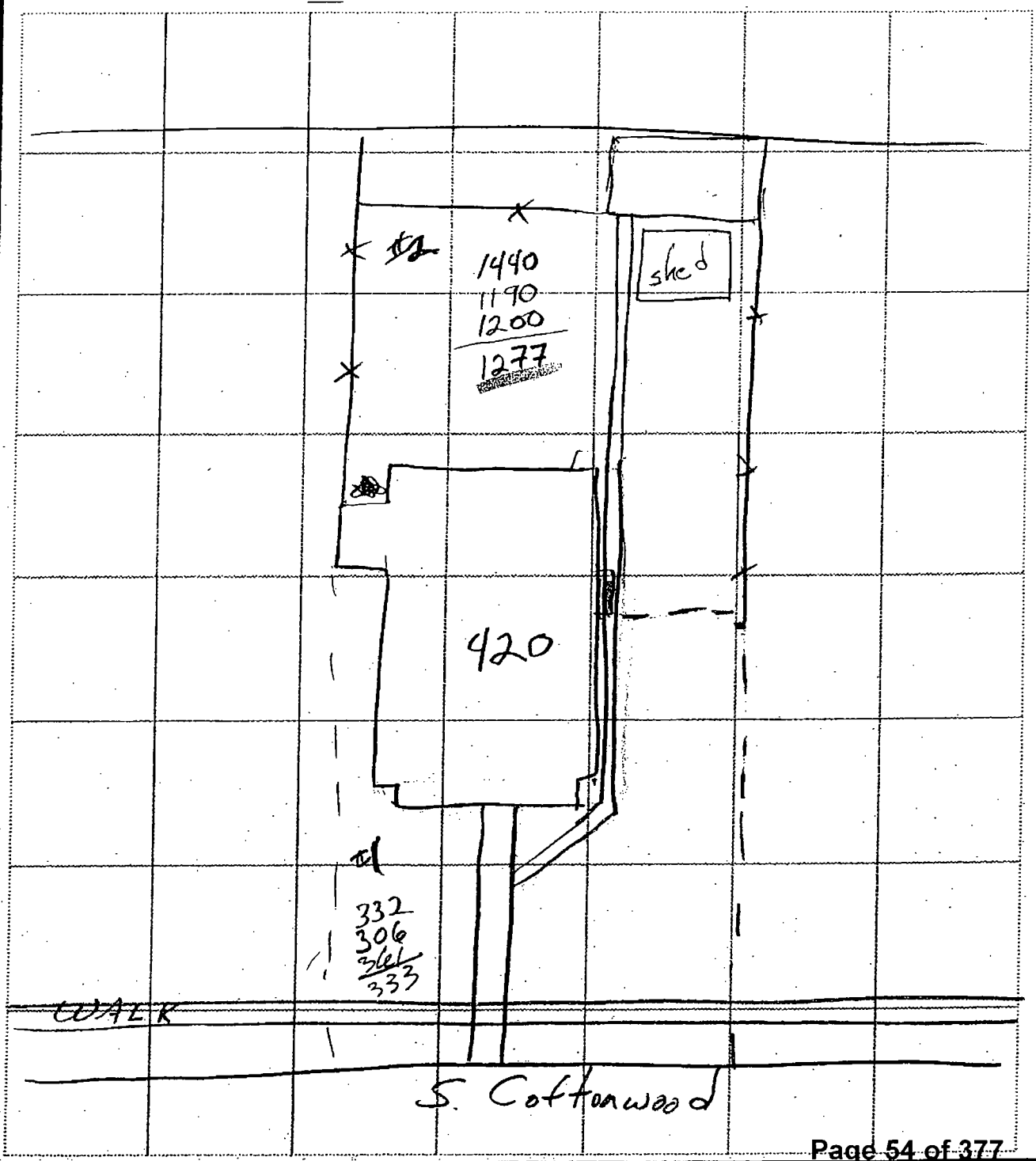


United Zinc # 1
Residential Property Screening Form
EPA Site # 309

Date(s): 8/30/06

	XRF I.D.	Operator
Screening Results:	58	ABK
Post-Removal:		

Name: Lois Heinrich
Address: 420 S. Cottonwood
Iola, KS 66749
Phone # 620-365-7975
Latitude N 37.91816
Longitude W 95.39999
Owner Information on back: ___



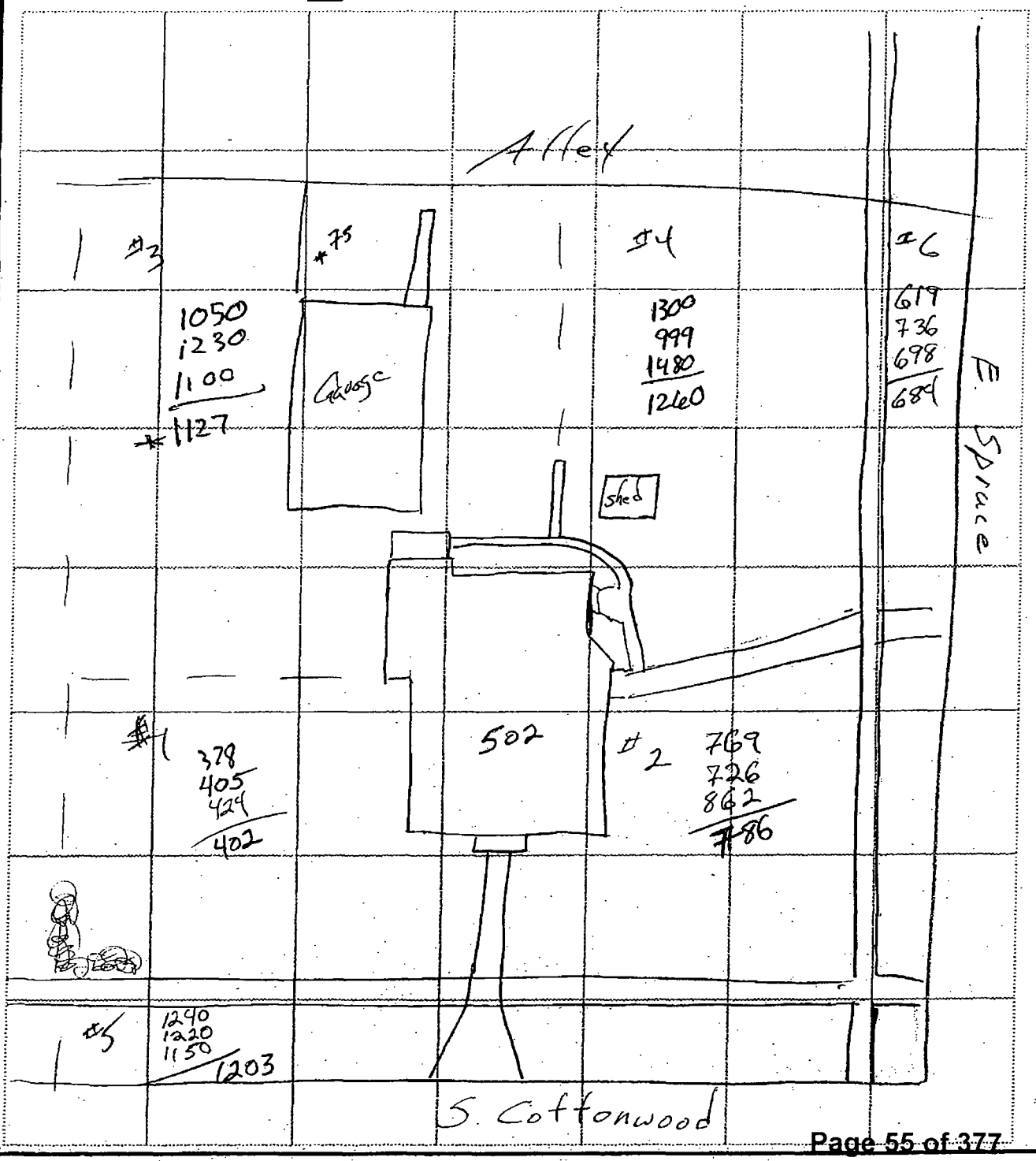
United Zinc # 1
Residential Property Screening Form
EPA Site # 314

Date(s): 8/31/05

Name: Sarah A. Burton
Address: 502 S. Cottonwood
Ida, Ks 66749
Phone #

Screening Results: XRF I.D. 58 Operator AH
Post-Removal:
Latitude N 37
Longitude

Owner Information on back: ___



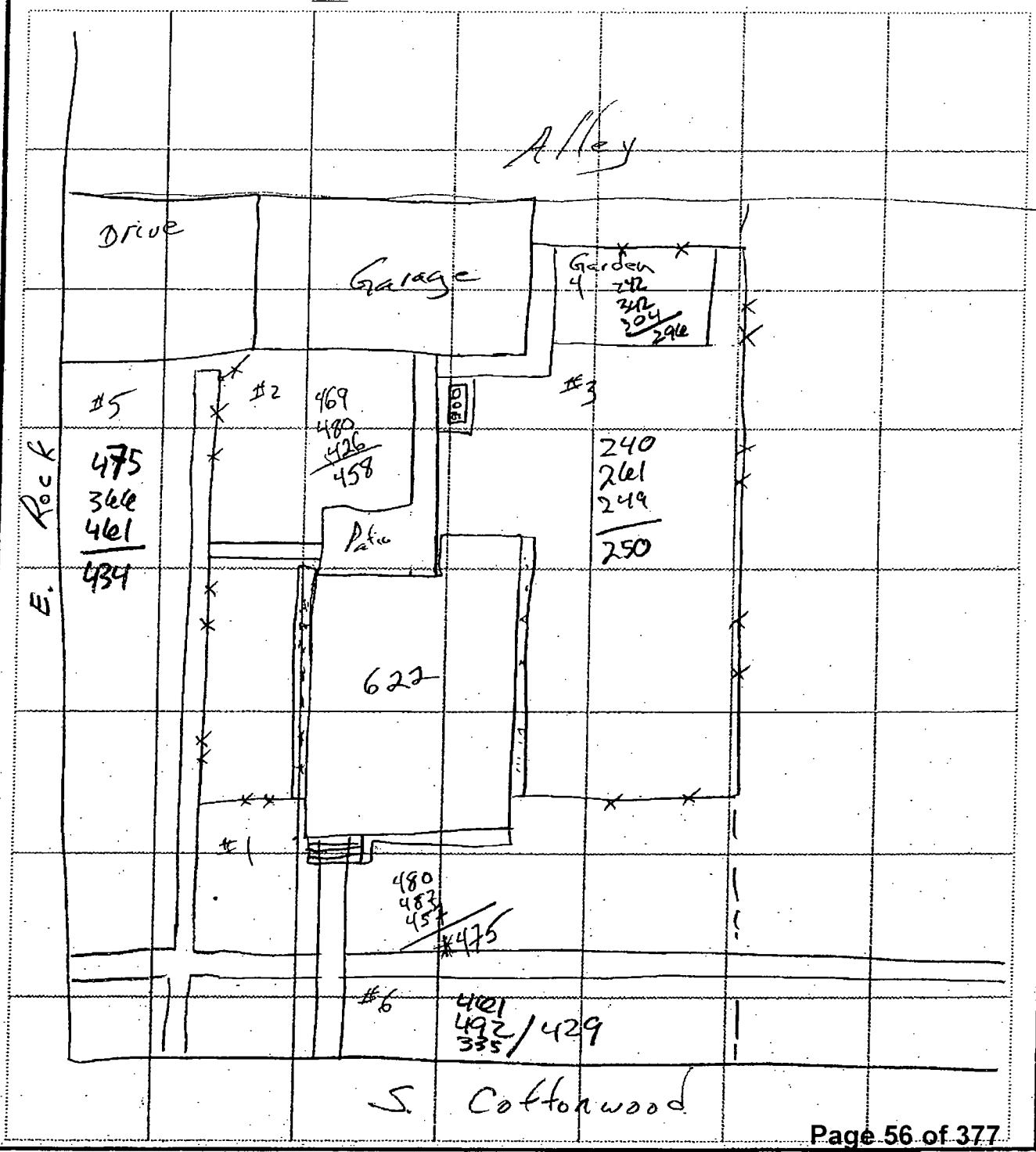
United Zinc # 1
Residential Property Screening Form
EPA Site # 315

Date(s): 8/31/06

Name: Walter F. Regehr Jr
Address: 622 S. Cottonwood
Iola, KS 66749
Phone # 620-365-7982
Owner Information on back: ___

	XRF I.D.	Operator
Screening Results:	58	AH
Post-Removal:		

Latitude N. 37.91597°
Longitude W 95.40019°



United Zinc # 1
Residential Property Screening Form
EPA Site # 328

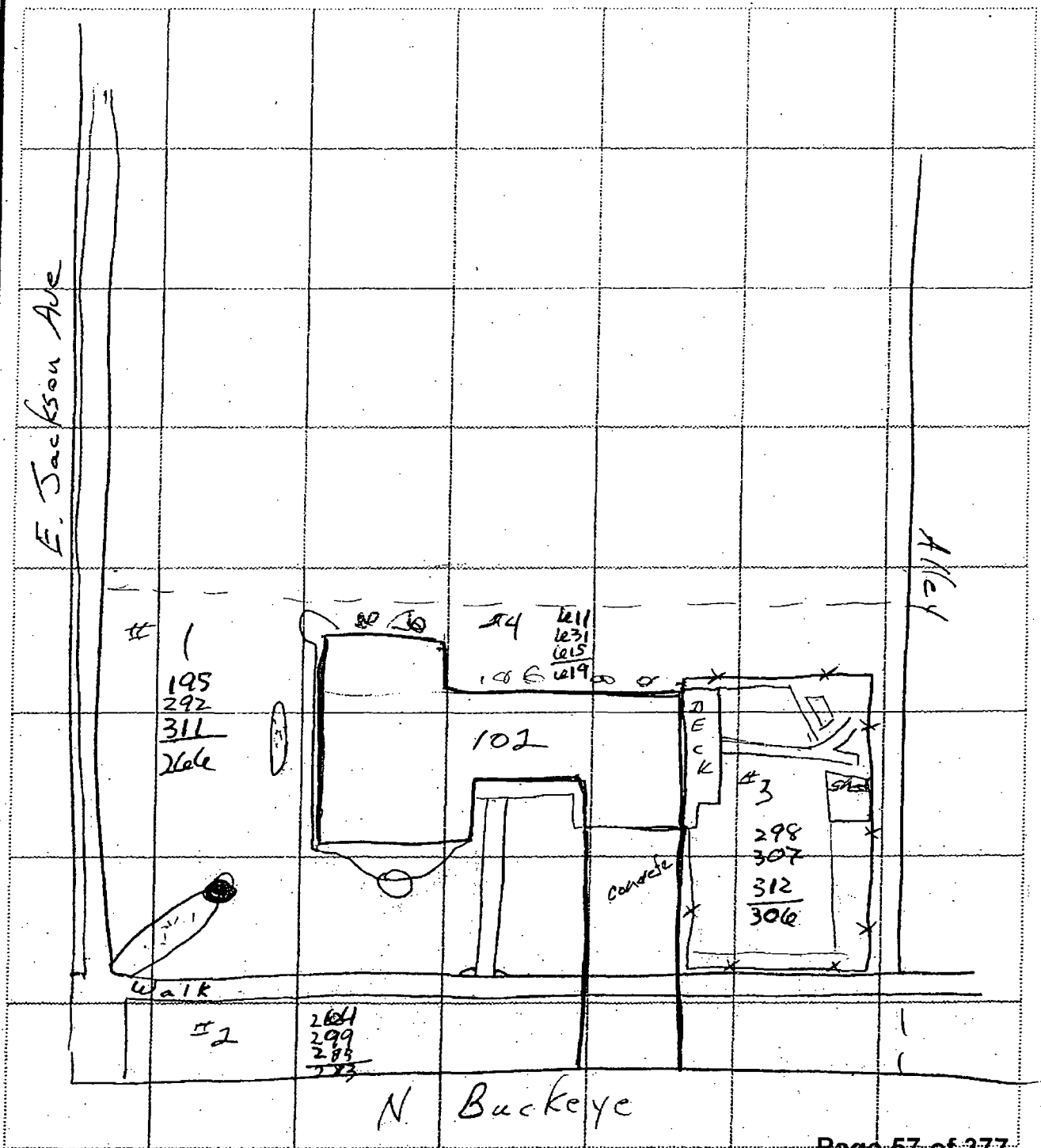
Date(s): 8/29/06

	XRF I.D.	Operator
Screening Results:	58	AH
Post-Removal:		

Name: Jerry Skidmore
Address: 102 N. Buckeye
Iola, Ks 66749
Phone # 620-365-6200

Latitude N 37.92338°
Longitude W 95.40098°

Owner Information on back: ___



United Zinc # 1
Residential Property Screening Form
EPA Site # 325

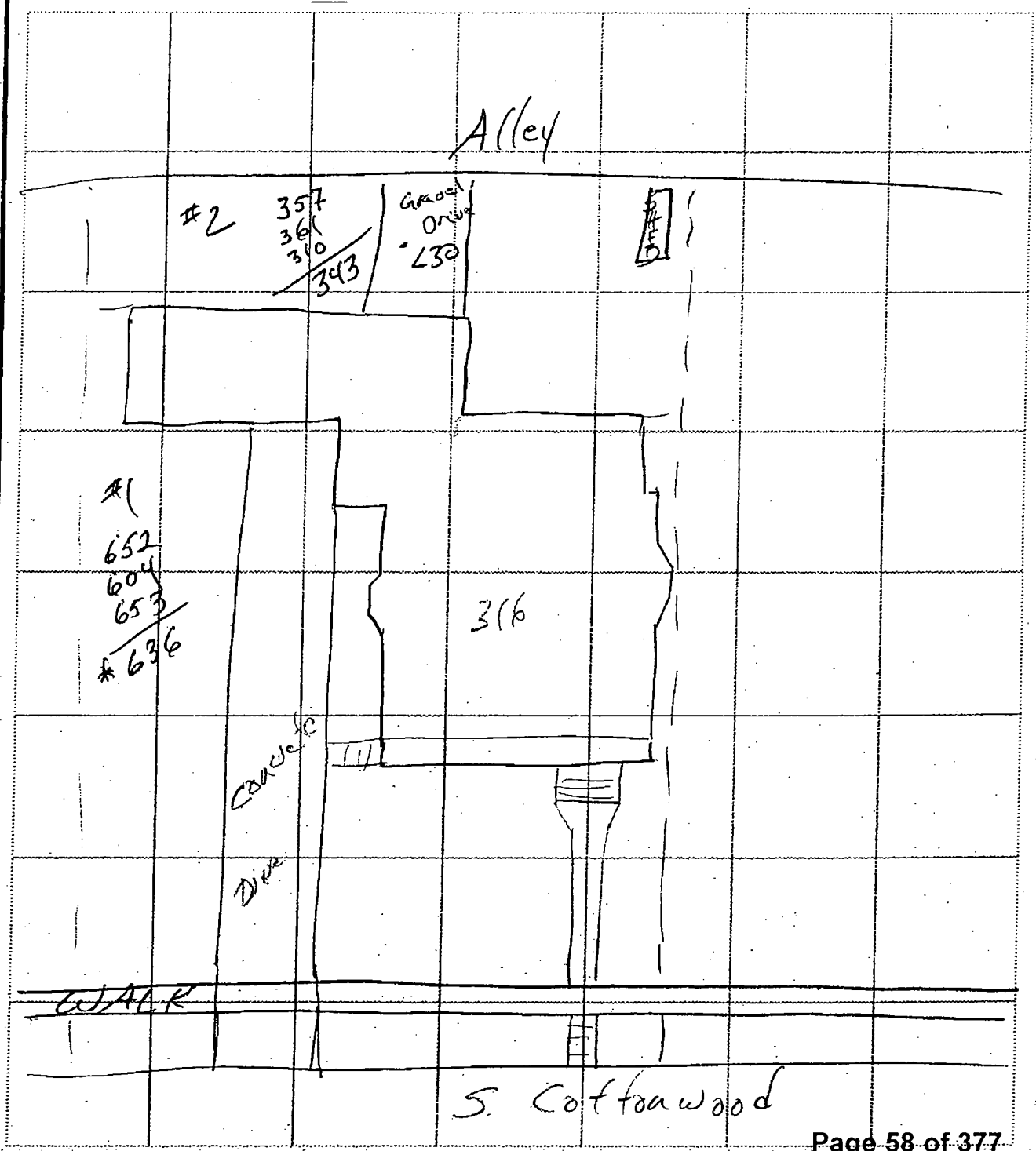
Date(s): 8/30/06

Name: Lewis R. Hoaland
Address: 316 S. Cottonwood
Ida, Ks 66749
Phone # 620-365-6966

	XRF I.D.	Operator
Screening Results:	58	AH
Post-Removal:		

Latitude N 37.91938
Longitude W 95.39993

Owner Information on back: ___



United Zinc # 1
Residential Property Screening Form
EPA Site # 326

Date(s): 8/30/05

Name: Jandy Wiltse
Address: 320½ S. Cottonwood
Iola, KS 66749
Phone # 620-365-6411
Owner Information on back: ___

	XRF I.D.	Operator
Screening Results:	58	AH
Post-Removal:		

Latitude N 37.91904°
Longitude W 95.40002°

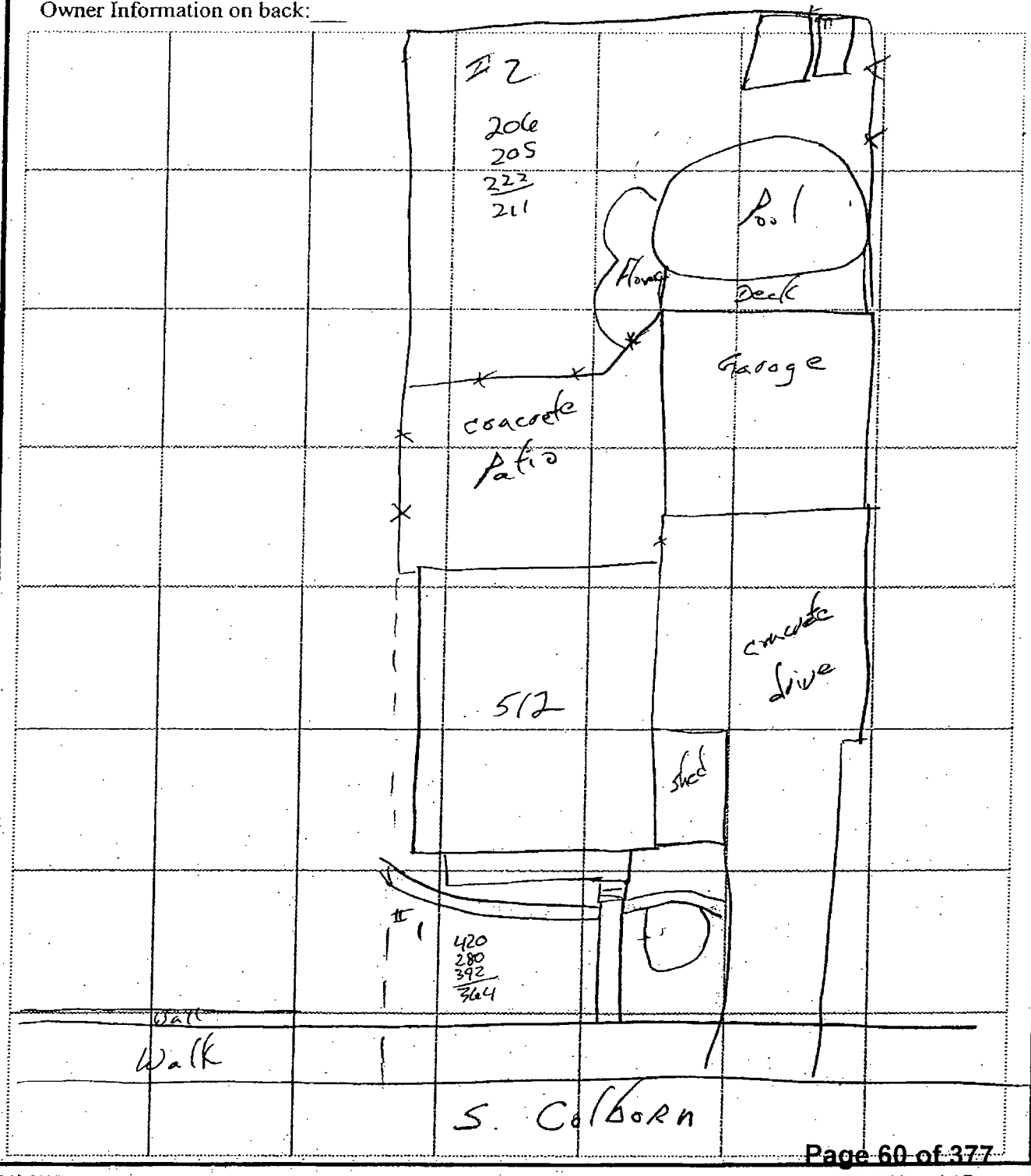
United Zinc # 1
Residential Property Screening Form
EPA Site # 330

Date(s): 9/8/06

Name: Kay Tindel
Address: 512 S. Colborn
Iola, Ks 66749
Phone #

Screening Results: XRF I.D. 58 Operator AA
Post-Removal:
Latitude N37.91735
Longitude W95.39871

Owner Information on back: ___



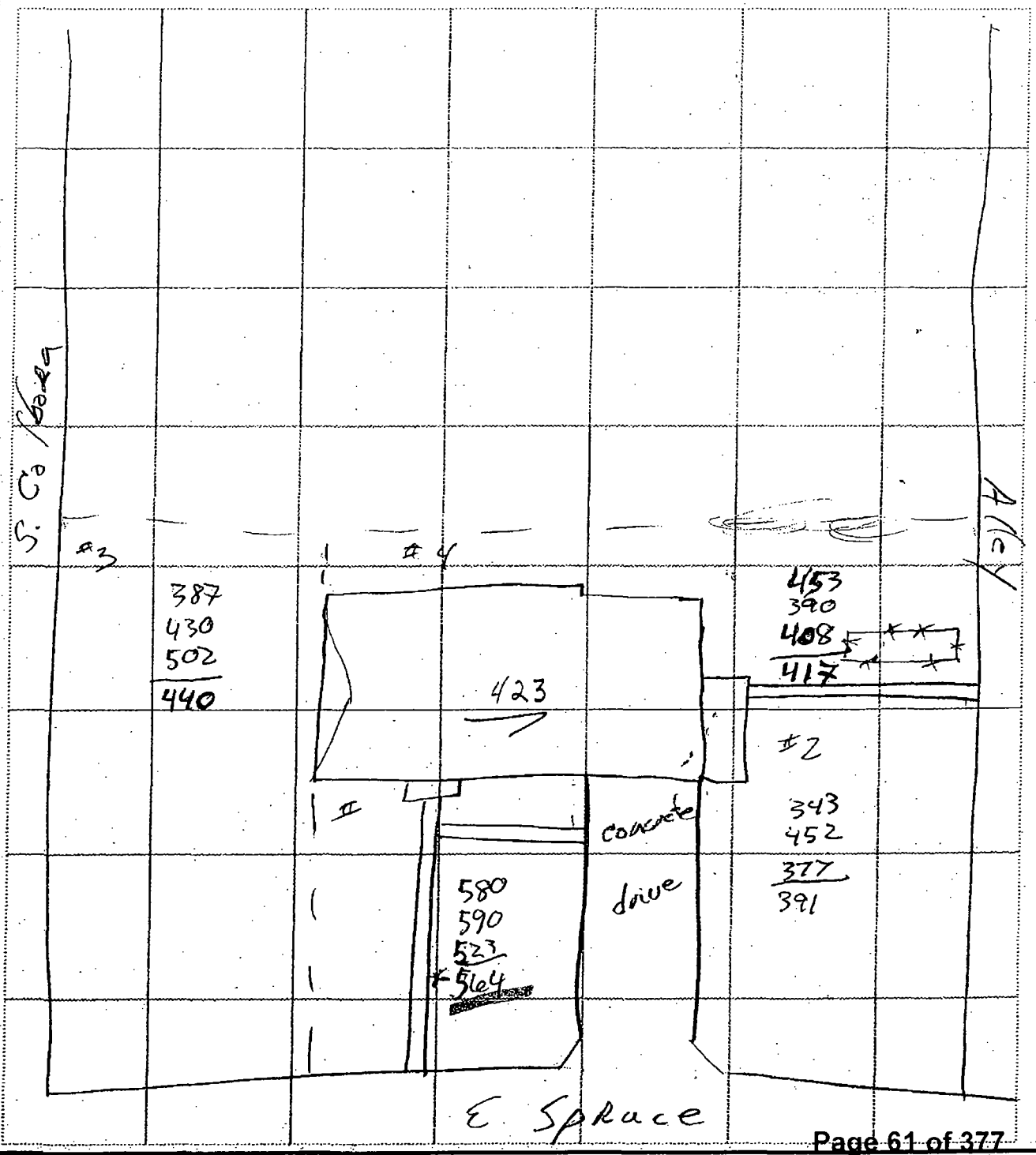
United Zinc # 1
Residential Property Screening Form
EPA Site # 333

Date(s): 9/11/06

Name: James Heinrich
Address: 423 S. Colborn
Iola, Ks 66749
Phone #
Owner Information on back: X

	XRF I.D.	Operator
Screening Results:	58	AH
Post-Removal:		

Latitude N37.91797
Longitude W 95.39838



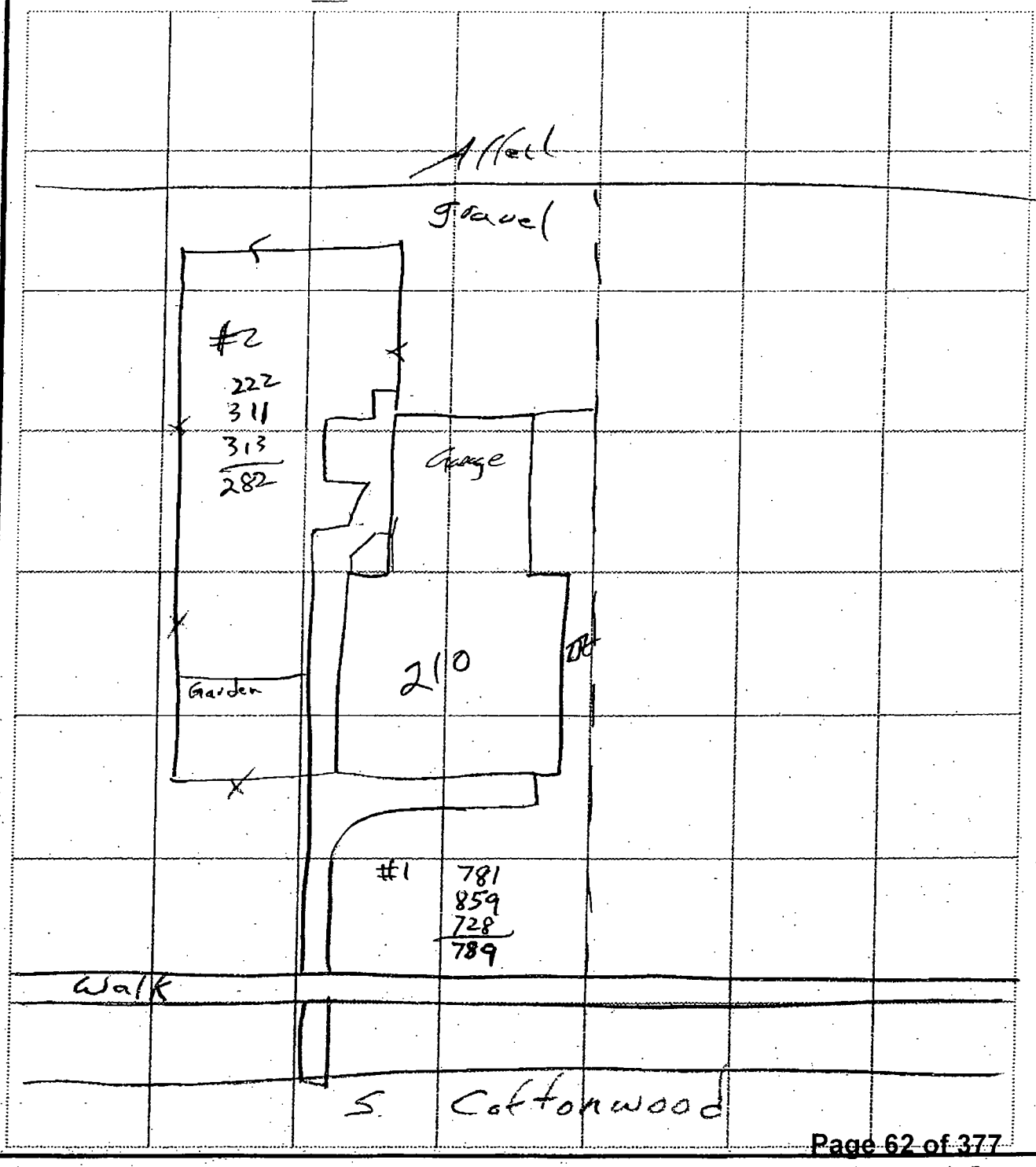
United Zinc # 1
Residential Property Screening Form
EPA Site # 324

Date(s): 8/29/06

Name: Steve Barnes
Address: 210 S. Cottonwood
Iola, Ks 66749
Phone # 620-365-0073
Owner Information on back: ___

	XRF I.D.	Operator
Screening Results:	58	All
Post-Removal:		

Latitude N 37.92048°
Longitude W 95.39995°



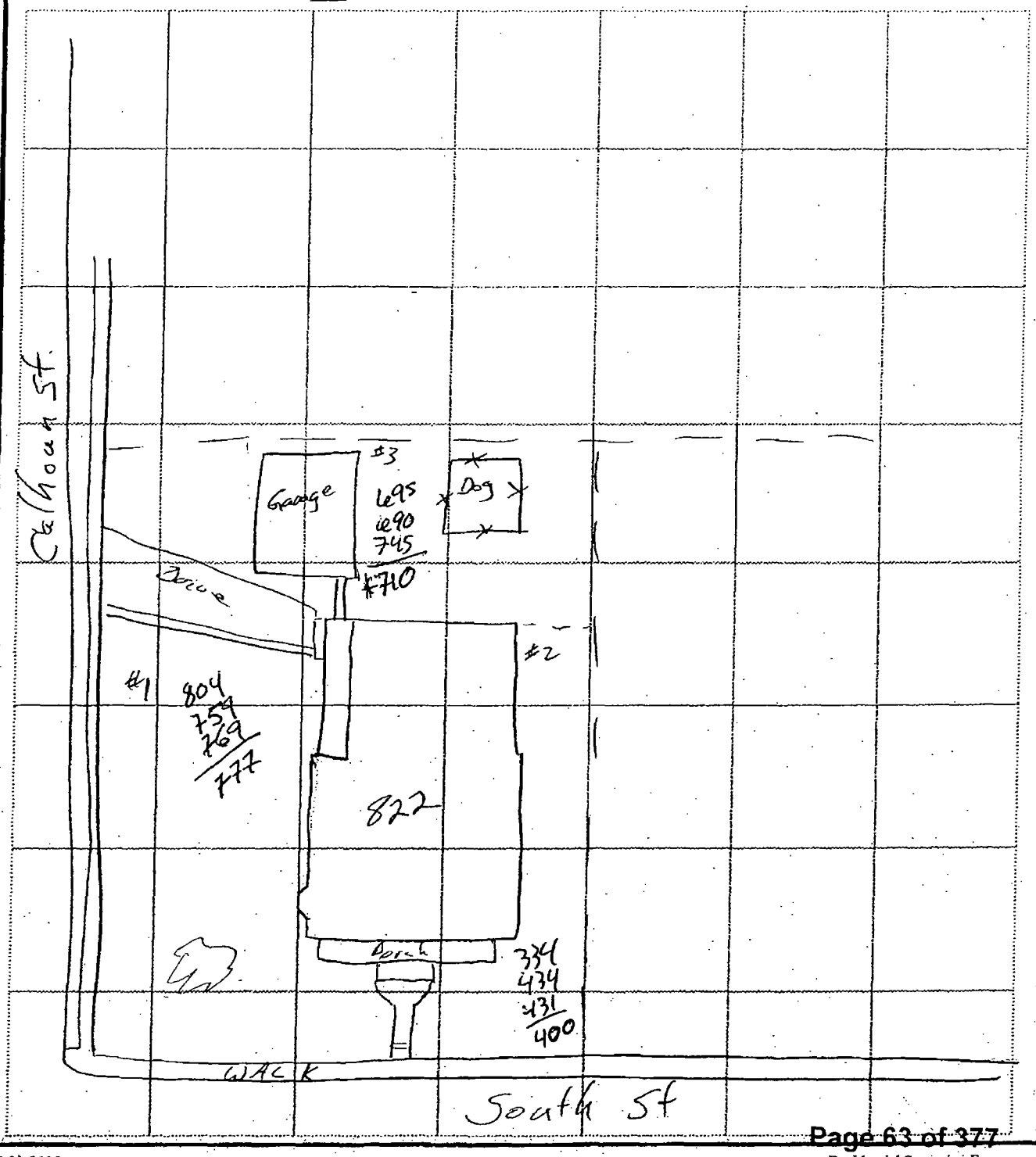
United Zinc # 1
Residential Property Screening Form
EPA Site # 337

Date(s): 9/14/06

	XRF I.D.	Operator
Screening Results:	58	AH
Post-Removal:		

Name: Shari Hill
Address: 822 South St.
Iola, KS 66749
Phone # 620-365-7390
Owner Information on back: ___

Latitude N 37.91420
Longitude W 95.40466



1X

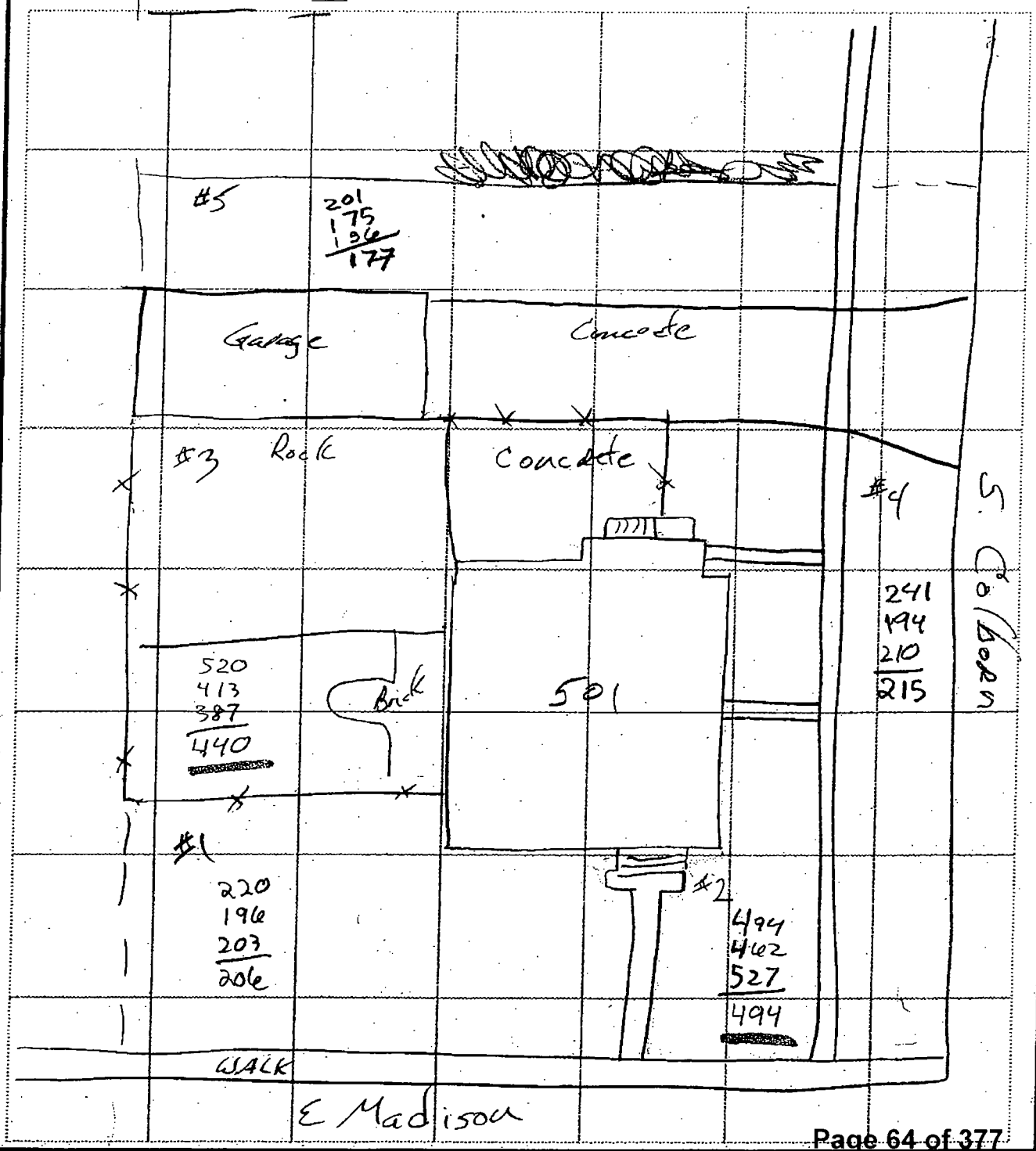
United Zinc # 1
Residential Property Screening Form
EPA Site # 340

Date(s): 8/30/06

Name: Benedikt Middleton
Address: 501 E. Madison
Iola, KS 66749
Phone # 620-365-2627
Owner Information on back: ___

	XRF I.D.	Operator
Screening Results:	58	AH
Post-Removal:		

Latitude N37.92136°
Longitude W95.39824°



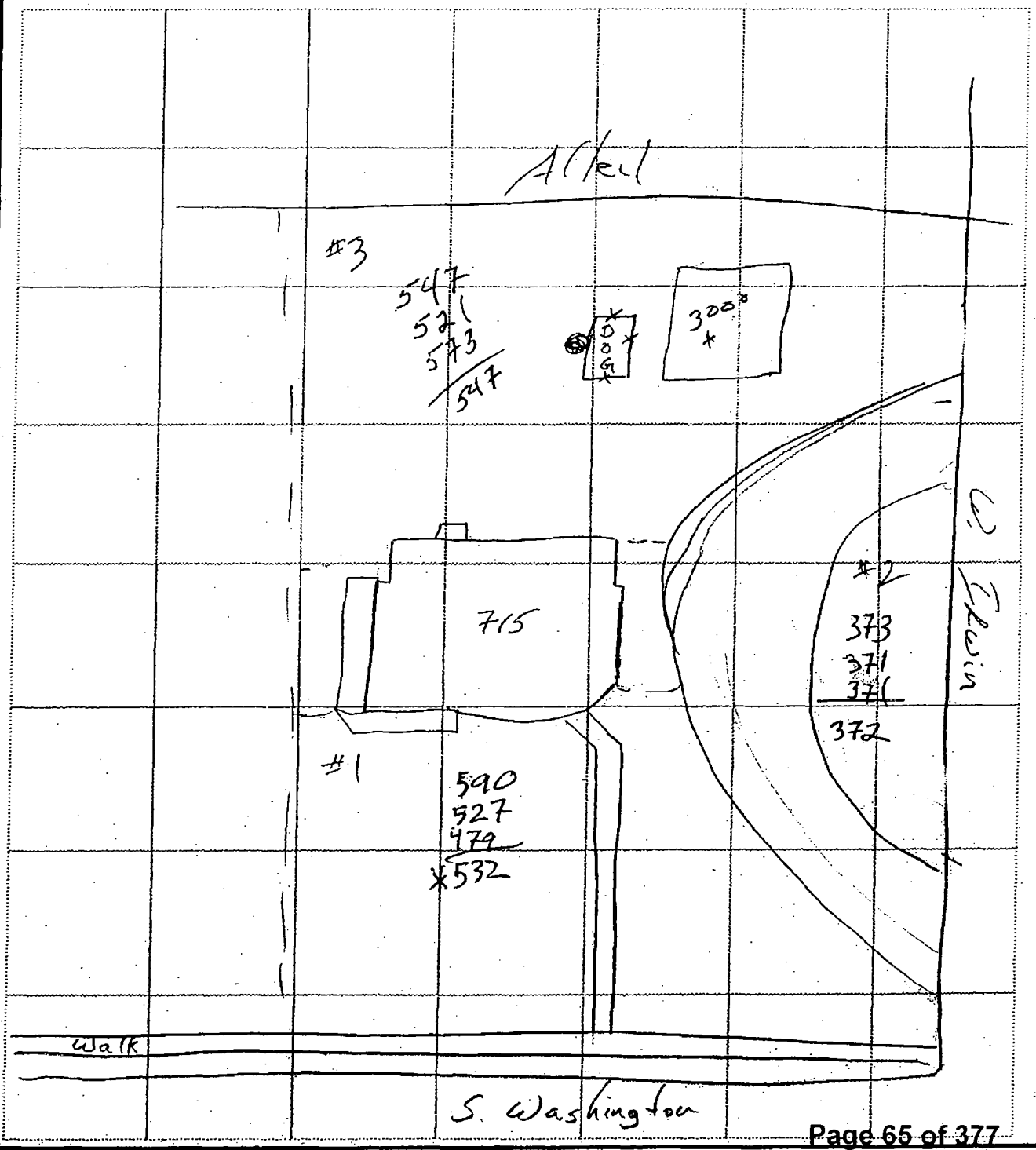
United Zinc # 1
Residential Property Screening Form
EPA Site # 341

Date(s): 9/15/06

	XRF I.D.	Operator
Screening Results:	58	
Post-Removal:		

Name: Lonnie Henkle
Address: 715 S. Washington
Iola, KS 66749
Phone # 620-365-6006
Owner Information on back: ___

Latitude N 37.94505°
Longitude W. 95.40540°



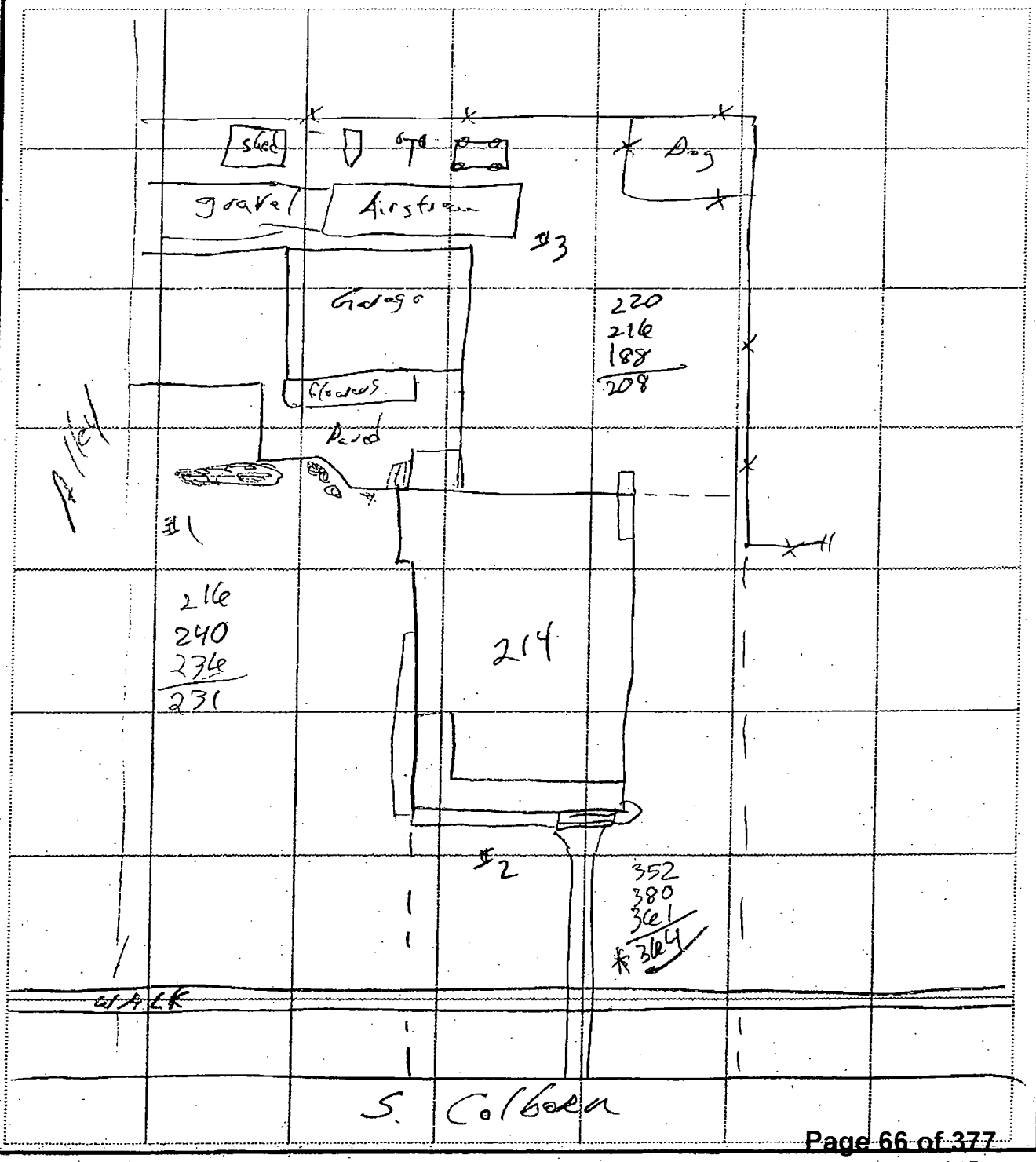
United Zinc # 1
Residential Property Screening Form
EPA Site # 346

Date(s): 9/12/06

Name: William Wilson
Address: 214 S. Colborn
Ida, Ks 66749
Phone #620-365-6693
Owner Information on back: ___

	XRF I.D.	Operator
Screening Results:	58	AH
Post-Removal:		

Latitude N 37.92059
Longitude W 95.39877



United Zinc # 1
Residential Property Screening Form
EPA Site # 354

Date(s): 9/13/06

Name: Apt

Address: 301 N. Buckeye
Iola, Ks 66749

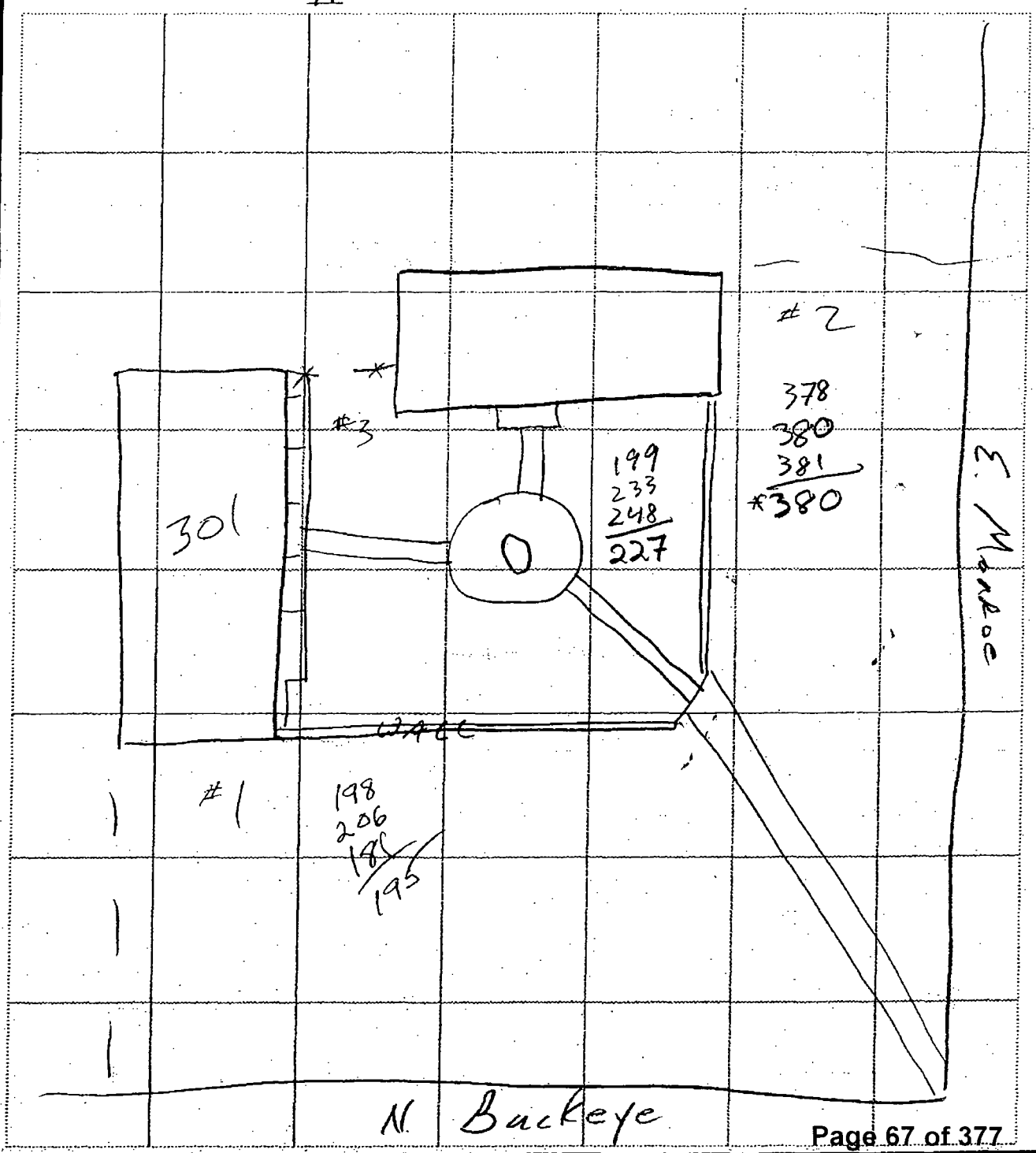
Phone #

Owner Information on back: X

	XRF I.D.	Operator
Screening Results:	58	RC
Post-Removal:		

Latitude N 37.92481°

Longitude W 95.3940100°



United Zinc # 1
Residential Property Screening Form
EPA Site # 356

Date(s): 9/12/06

	XRF I.D.	Operator
Screening Results:	58	AH
Post-Removal:		

Name:

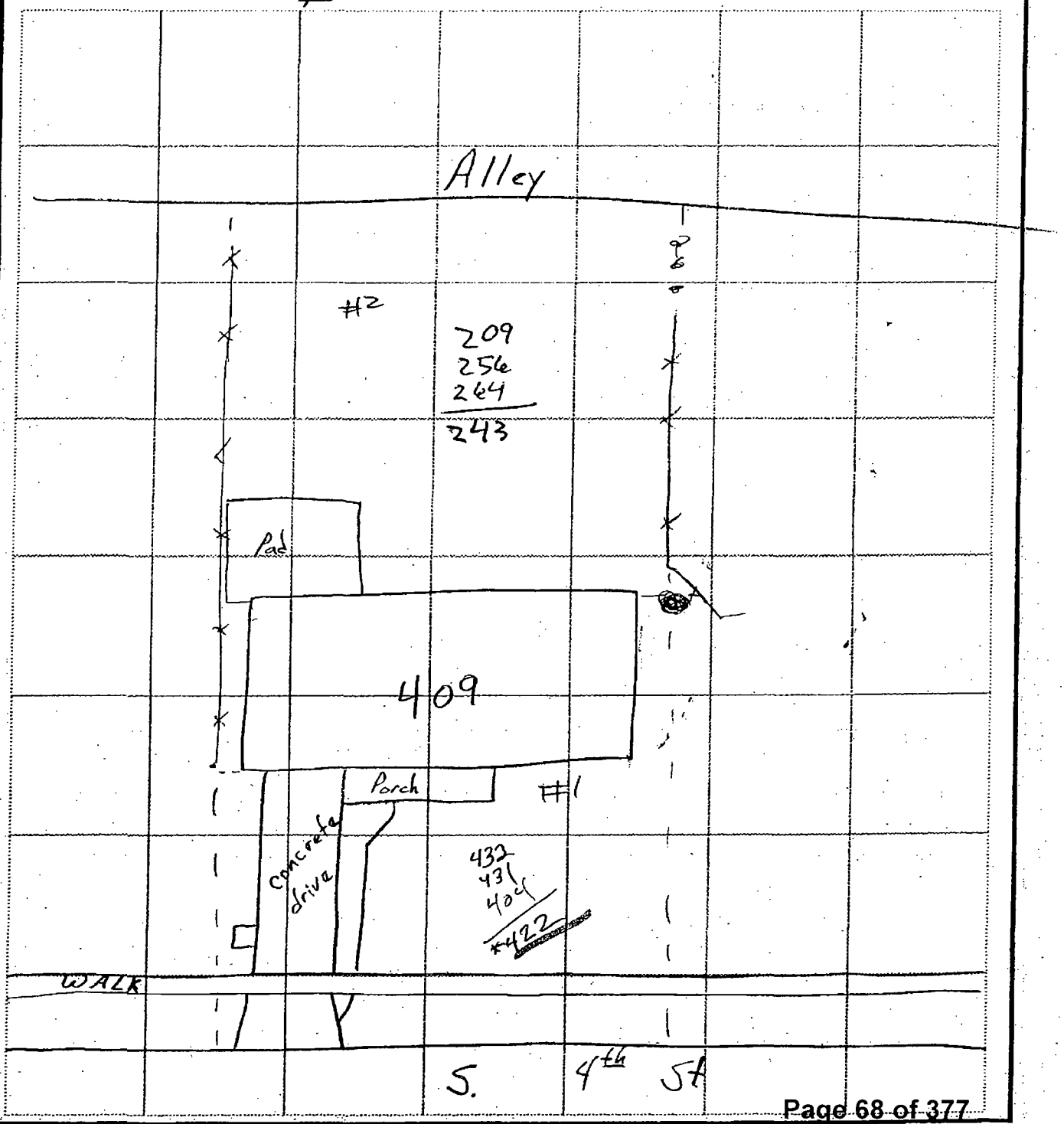
Address: 309 S. 4th
Iola, Ks 66749

Phone #

Latitude N 37.91946°

Longitude W 95.39178°

Owner Information on back: X



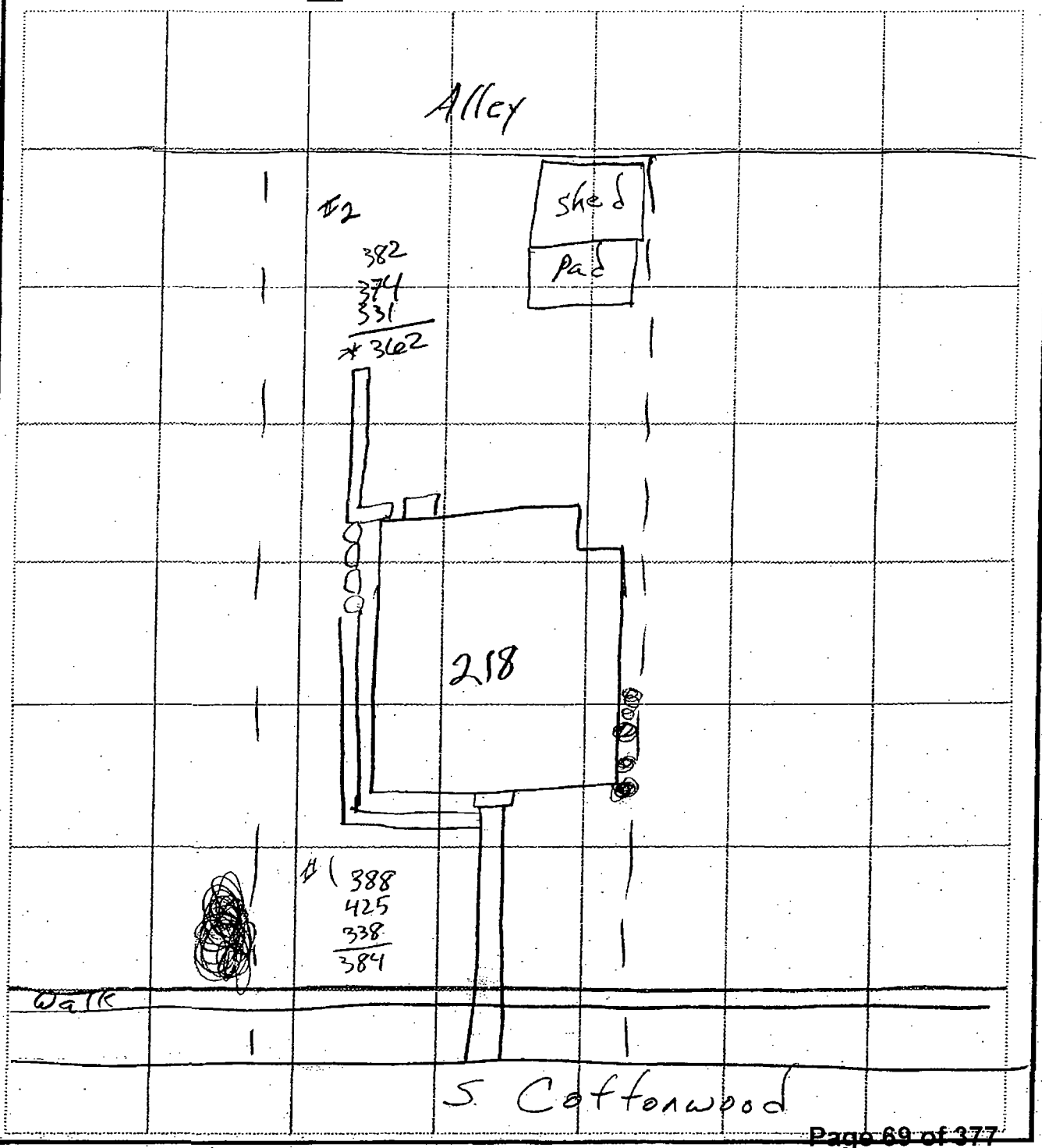
United Zinc # 1
Residential Property Screening Form
EPA Site # 364

Date(s): 9/7/06

Name: John Barker
Address: 218 S. Cottonwood
Iola, KS 66749
Phone # 620-363-1358
Owner Information on back: ___

	XRF I.D.	Operator
Screening Results:	58	AAS
Post-Removal:		

Latitude N37.92037
Longitude W95.39989



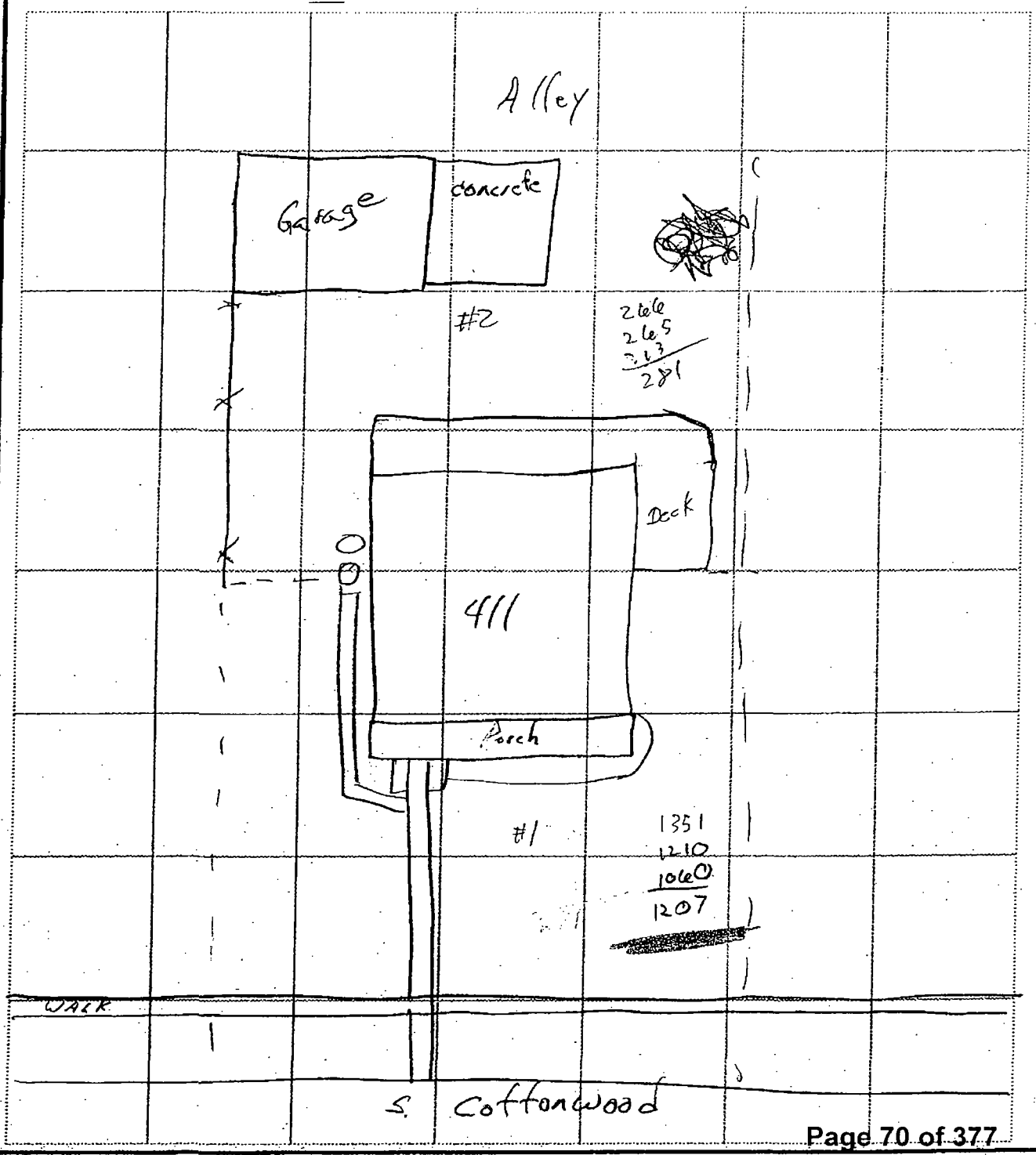
United Zinc # 1
Residential Property Screening Form
EPA Site # 3lele

Date(s): 9/7/06

Name: Judy Brigham
Address: 411 S. Cottonwood
Iola, KS. 66749
Phone #
Owner Information on back:

	XRF I.D.	Operator
Screening Results:	58	AA
Post-Removal:		

Latitude N37.91843°
Longitude W95.39988°



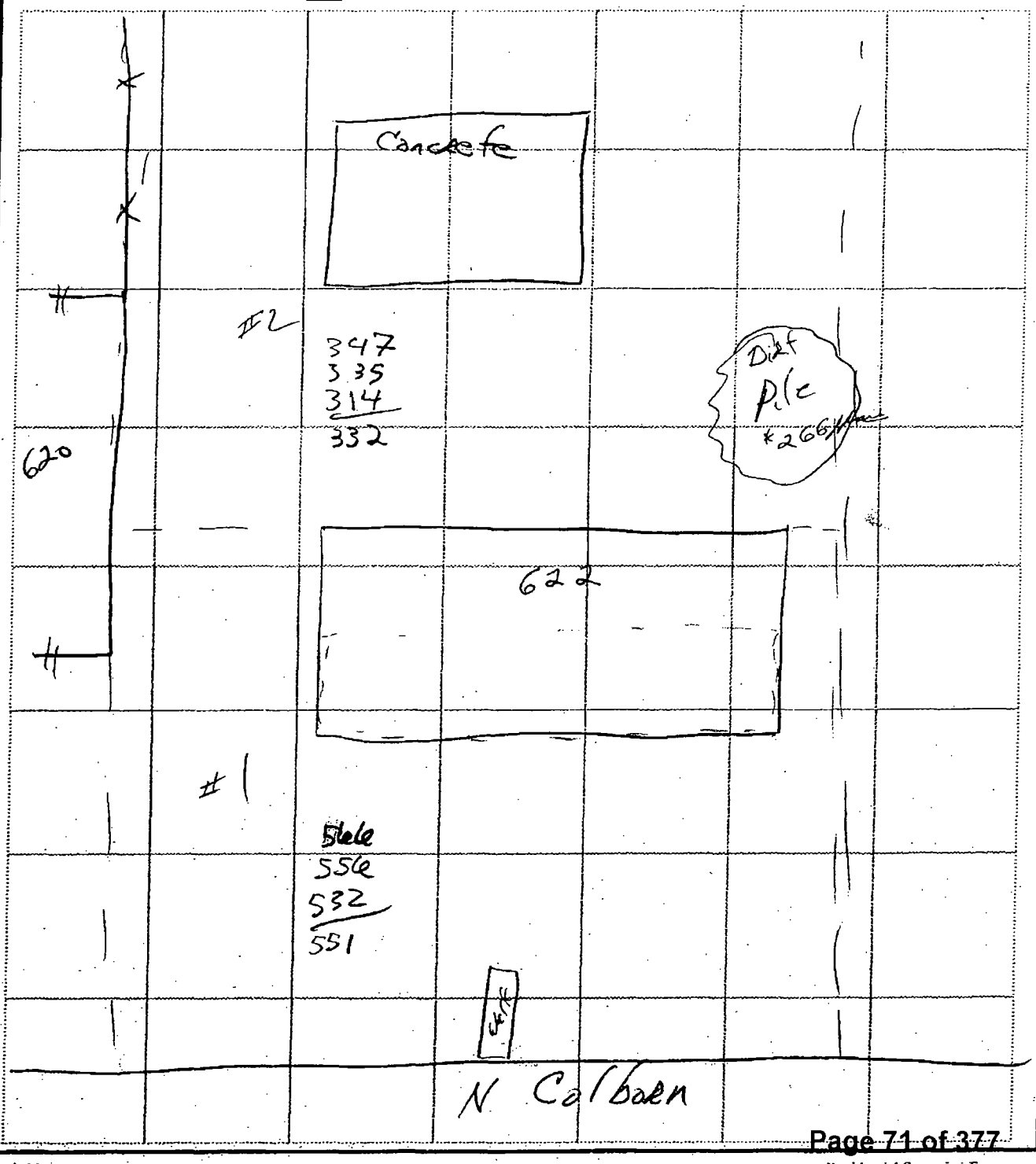
child

United Zinc # 1
Residential Property Screening Form
EPA Site # 373

Date(s): 9/6/06

	XRF I.D.	Operator
Screening Results:	58	
Post-Removal:		

Name: Belinda Hamilton
Address: 622 N. Colborn
Iola, KS. 66749
Phone # 620-365-7626
Latitude N37.92849°
Longitude W95.39884°
Owner Information on back: ___



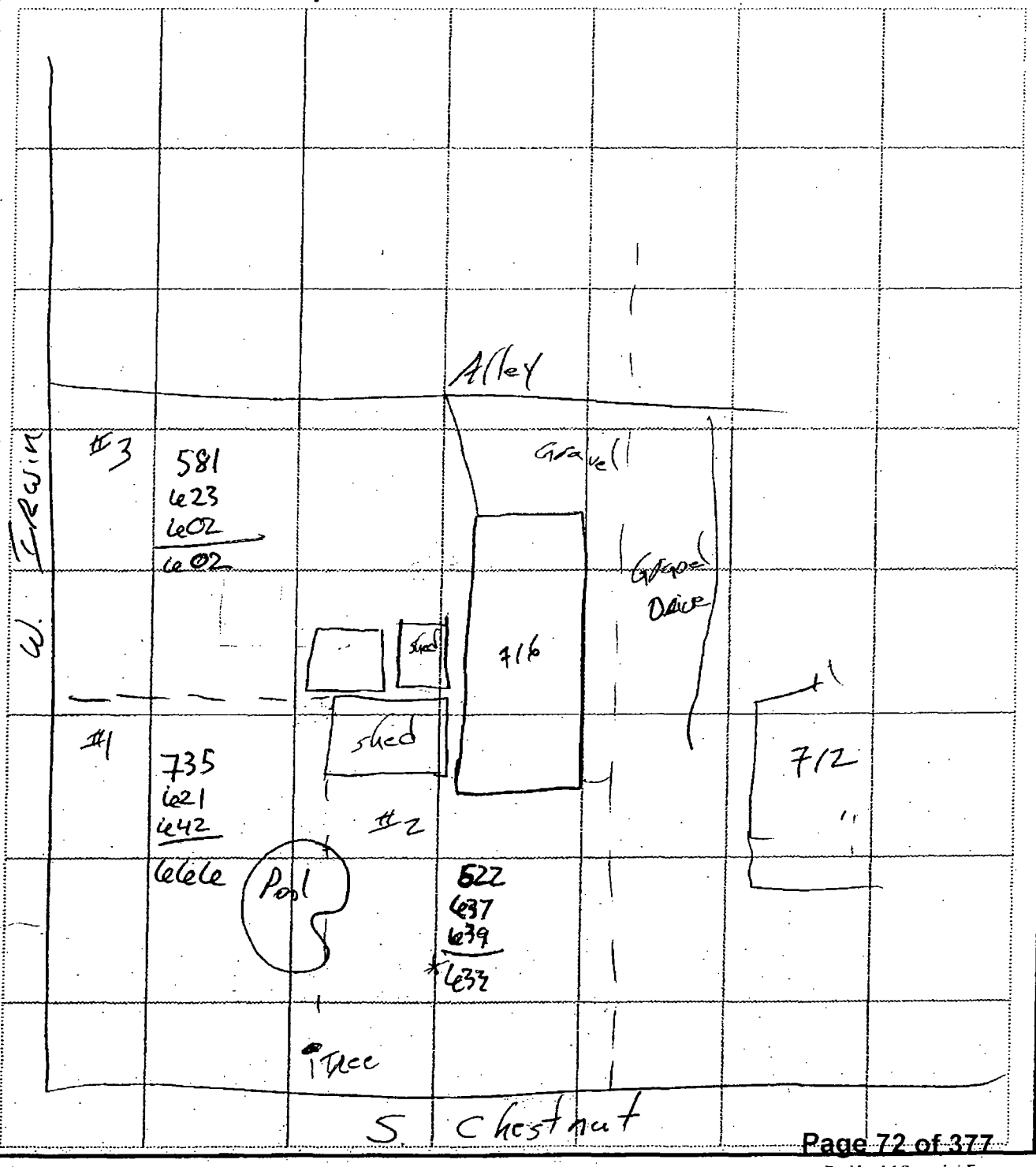
United Zinc # 1
Residential Property Screening Form
EPA Site # 378

Date(s): 9/15/06

	XRF I.D.	Operator
Screening Results:	58	AH
Post-Removal:		

Name:
Address: 716 S. Chestnut
Iola, Ks 66749
Phone #
Owner Information on back: X

Latitude N 37.
Longitude W 95.



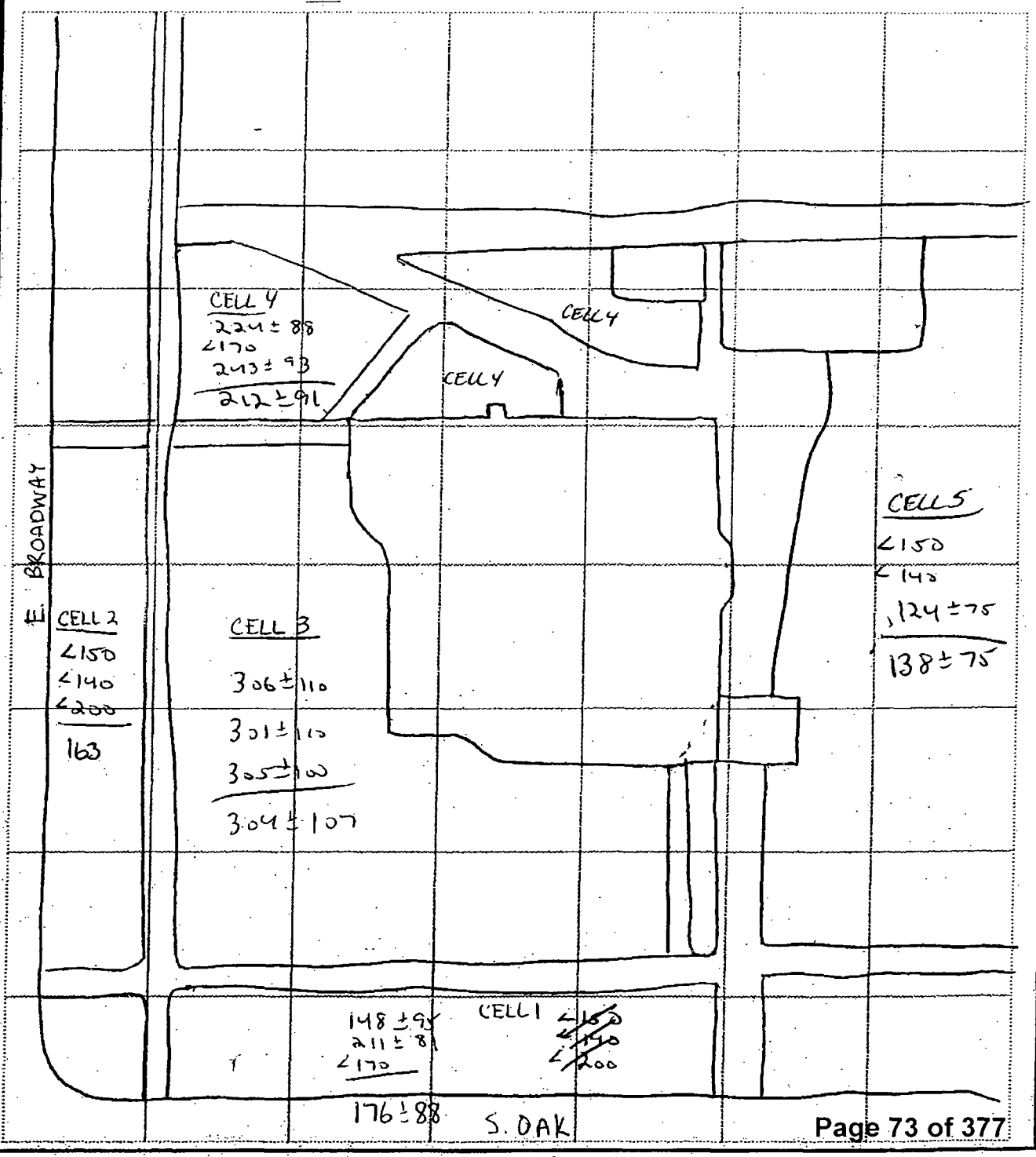
United Zinc # 1
Residential Property Screening Form
EPA Site # 387

Date(s): 9/26/06

	XRF I.D.	Operator
Screening Results:	62	JPIBE
Post-Removal:		

Name: Gary Stout
Address: 222 S. Oak
Iola, KS 66749
Phone #620-365-8270
Owner Information on back: ___

Latitude 37.98020
Longitude 95.39787



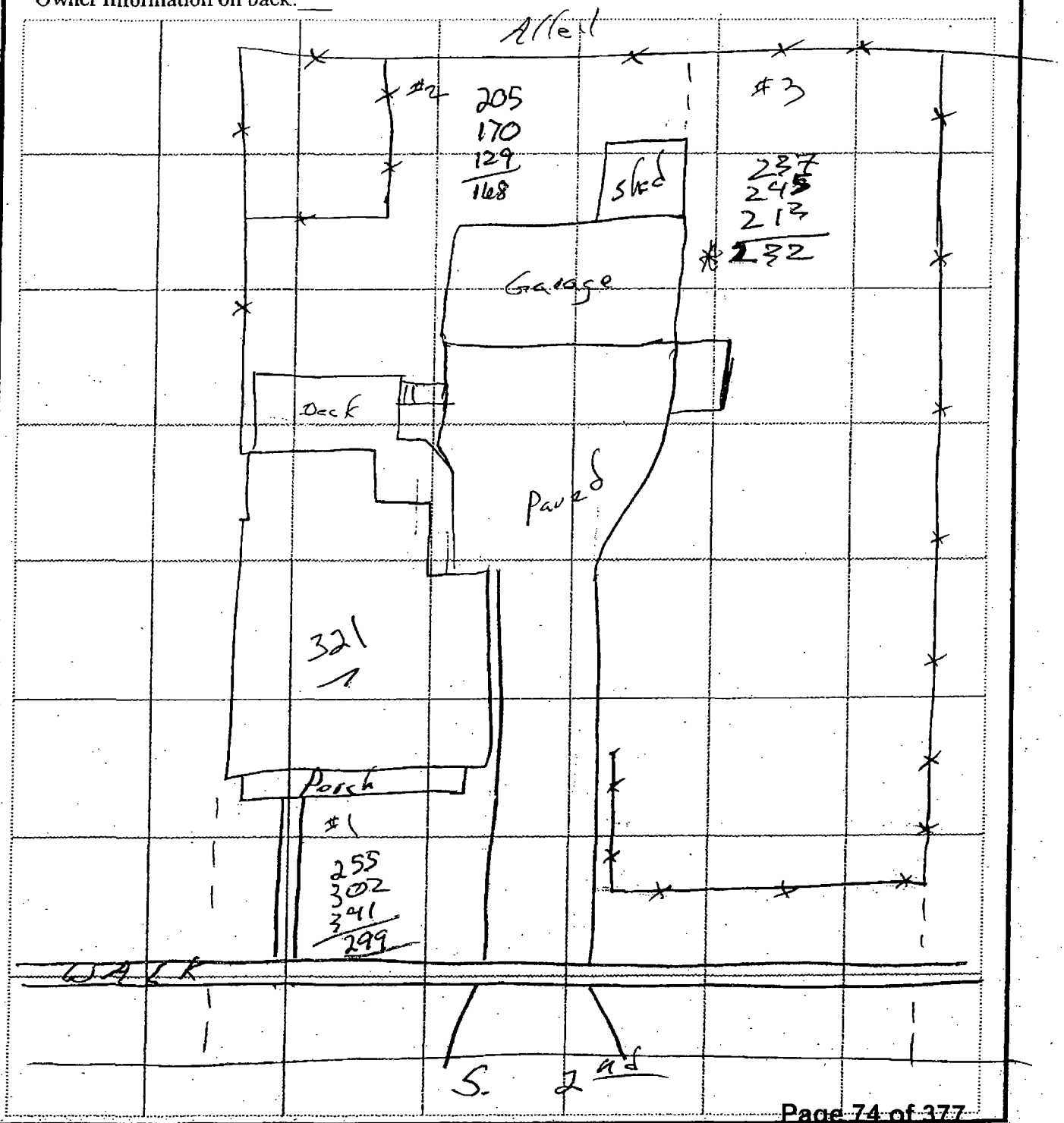
United Zinc # 1
Residential Property Screening Form
EPA Site # 389

Date(s): 9/12/06

Name: Gary Wells
Address: 321 S. 2nd
Iola, Ks 66749
Phone # 620-365-6265
Owner Information on back: ___

	XRF I.D.	Operator
Screening Results:	58	AA
Post-Removal:		

Latitude N 37.91912°
Longitude W 95.39401°



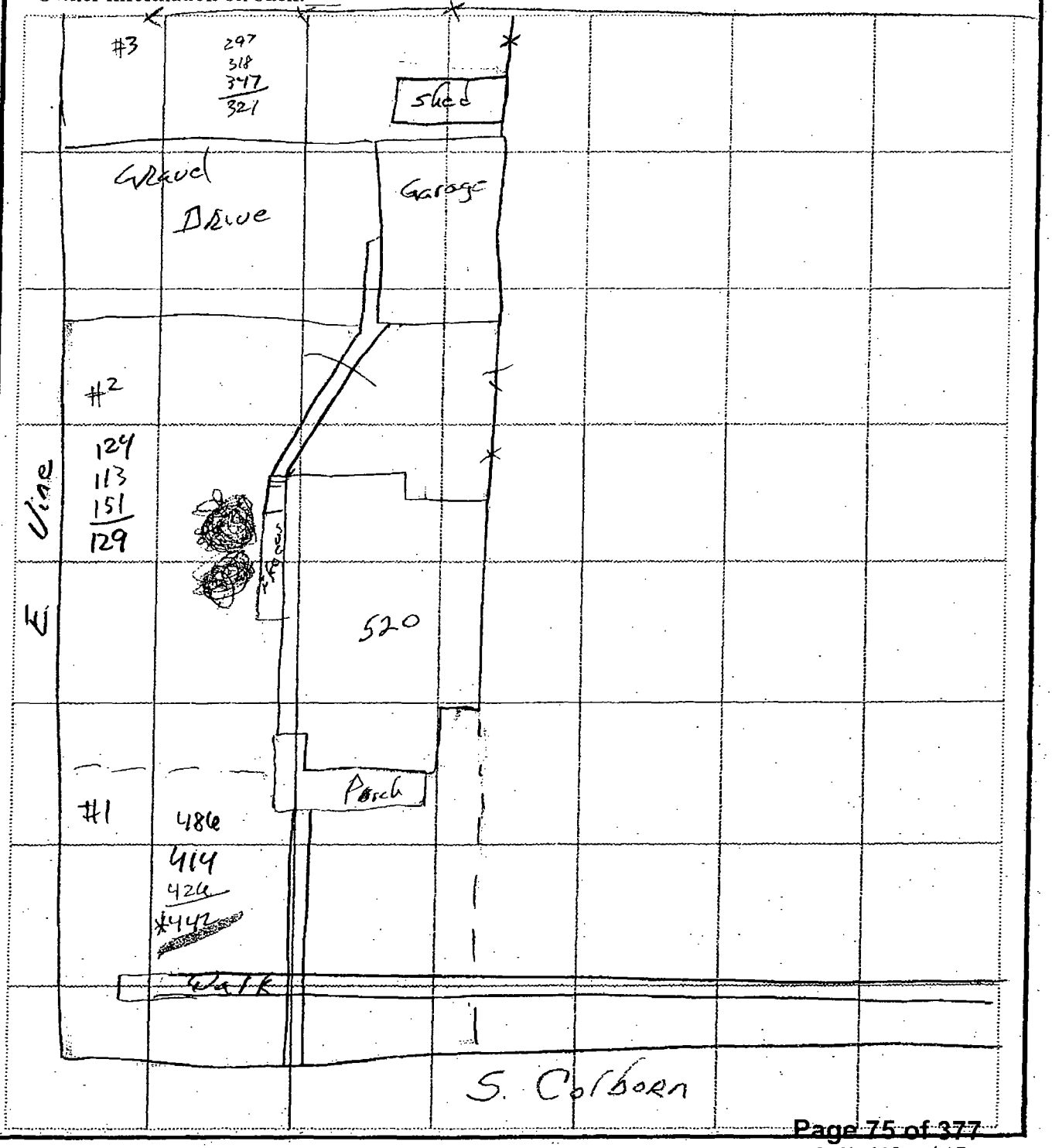
United Zinc # 1
Residential Property Screening Form
EPA Site # 392

Date(s): 7/11/06

Name: Catherine Burke
Address: 520 S. Colborn
Iola, Ks 66749
Phone # 620-363-0723
Owner Information on back:

	XRF I.D.	Operator
Screening Results:	58	AH
Post-Removal:		

Latitude N 37.91688
Longitude W95.39870



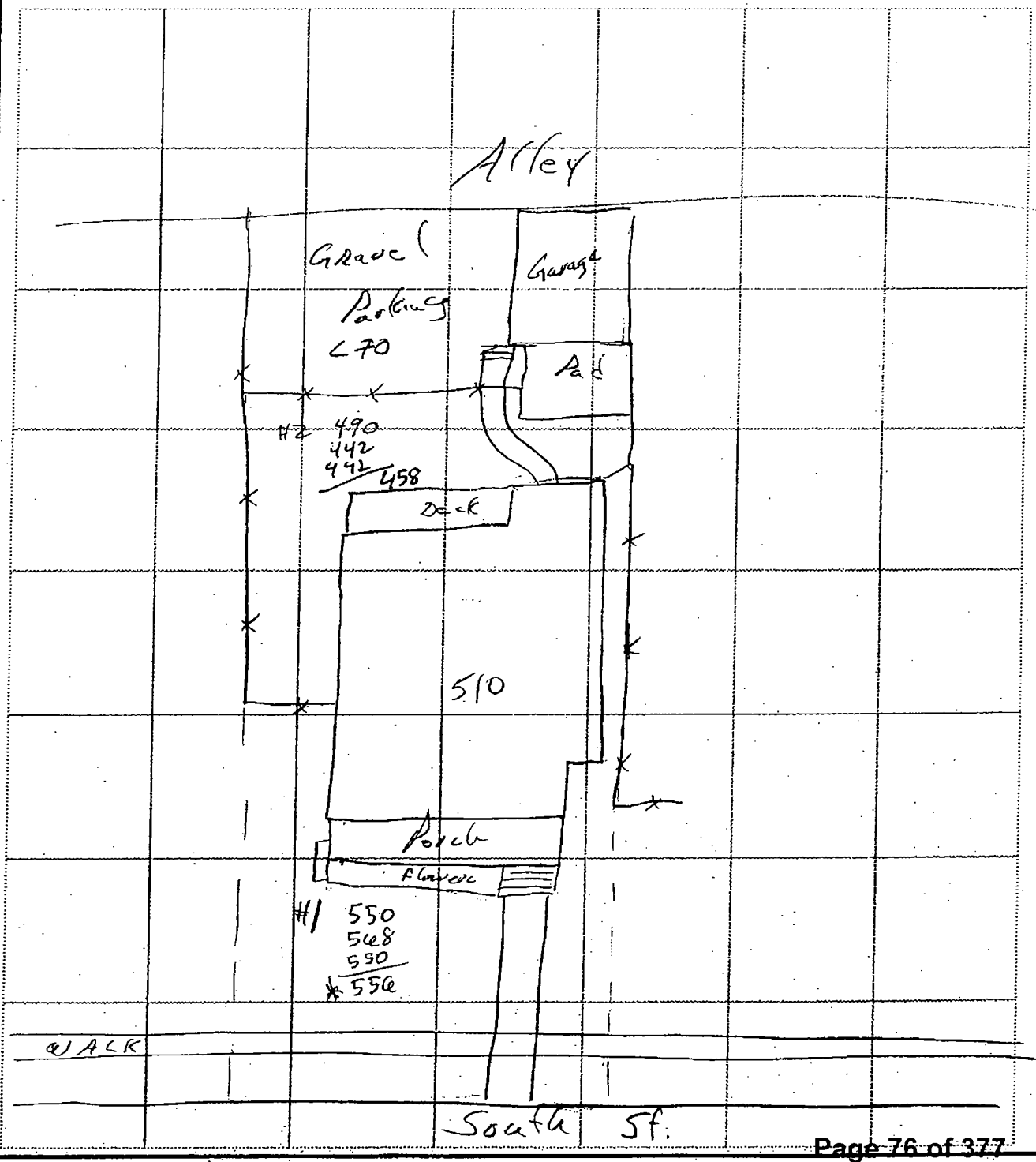
United Zinc # 1
Residential Property Screening Form
EPA Site # 394

Date(s): 9/14/06

Name: Maleta K. Hacker
Address: 510 South St
Iola, KS 66749
Phone # 620-365-7835
Owner Information on back: ___

	XRF I.D.	Operator
Screening Results:	58	AH
Post-Removal:		

Latitude N 37.91729°
Longitude W 95.40447°



United Zinc # 1
Residential Property Screening Form
EPA Site # 396

Date(s): 9/19/06

Name: —

Address: 216 S. 2nd
Iola, Ks 66749

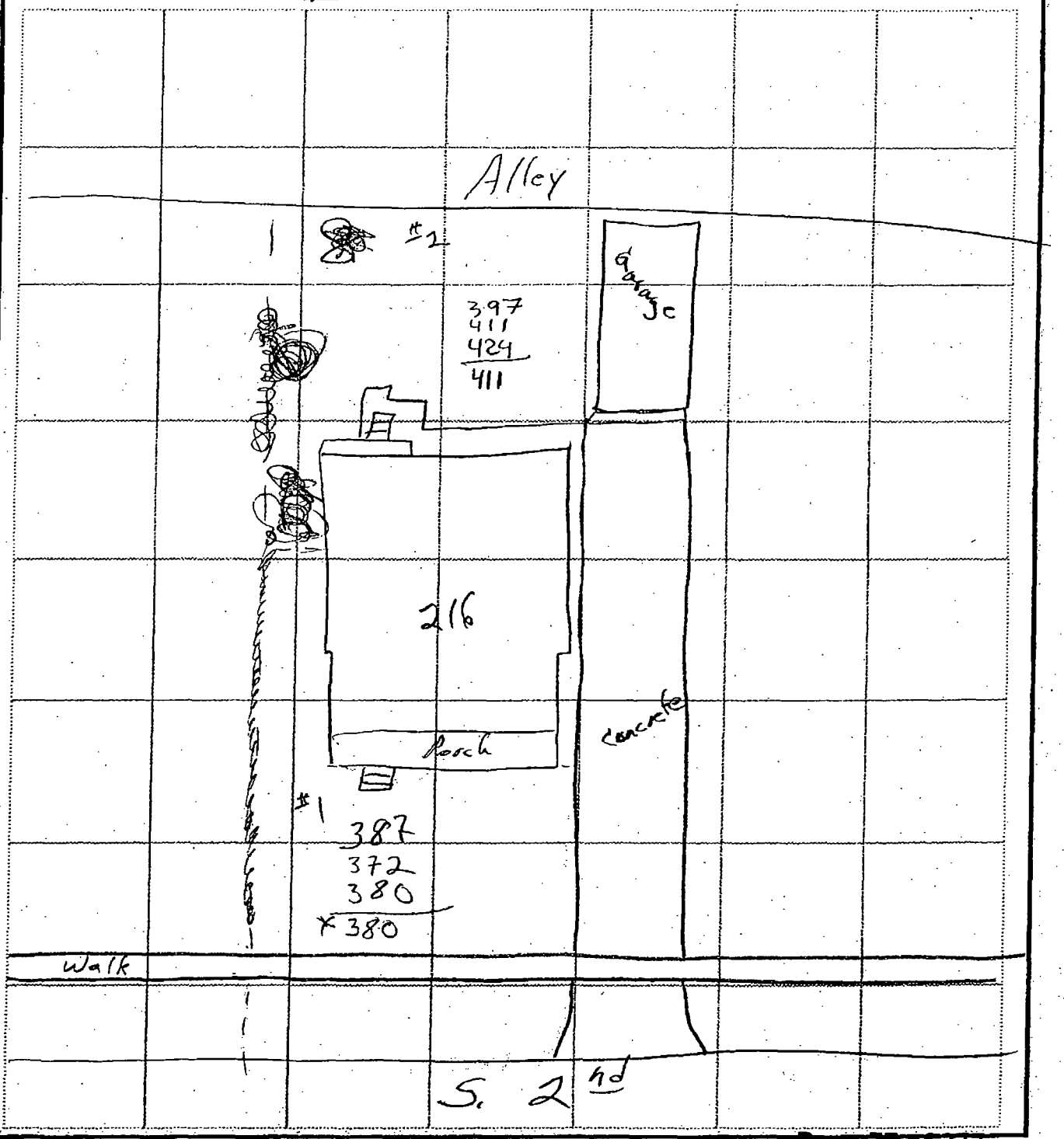
Phone #

Owner Information on back: X

	XRF I.D.	Operator
Screening Results:	58	AH
Post-Removal:		

Latitude N 37.92030°

Longitude W 95.39425°



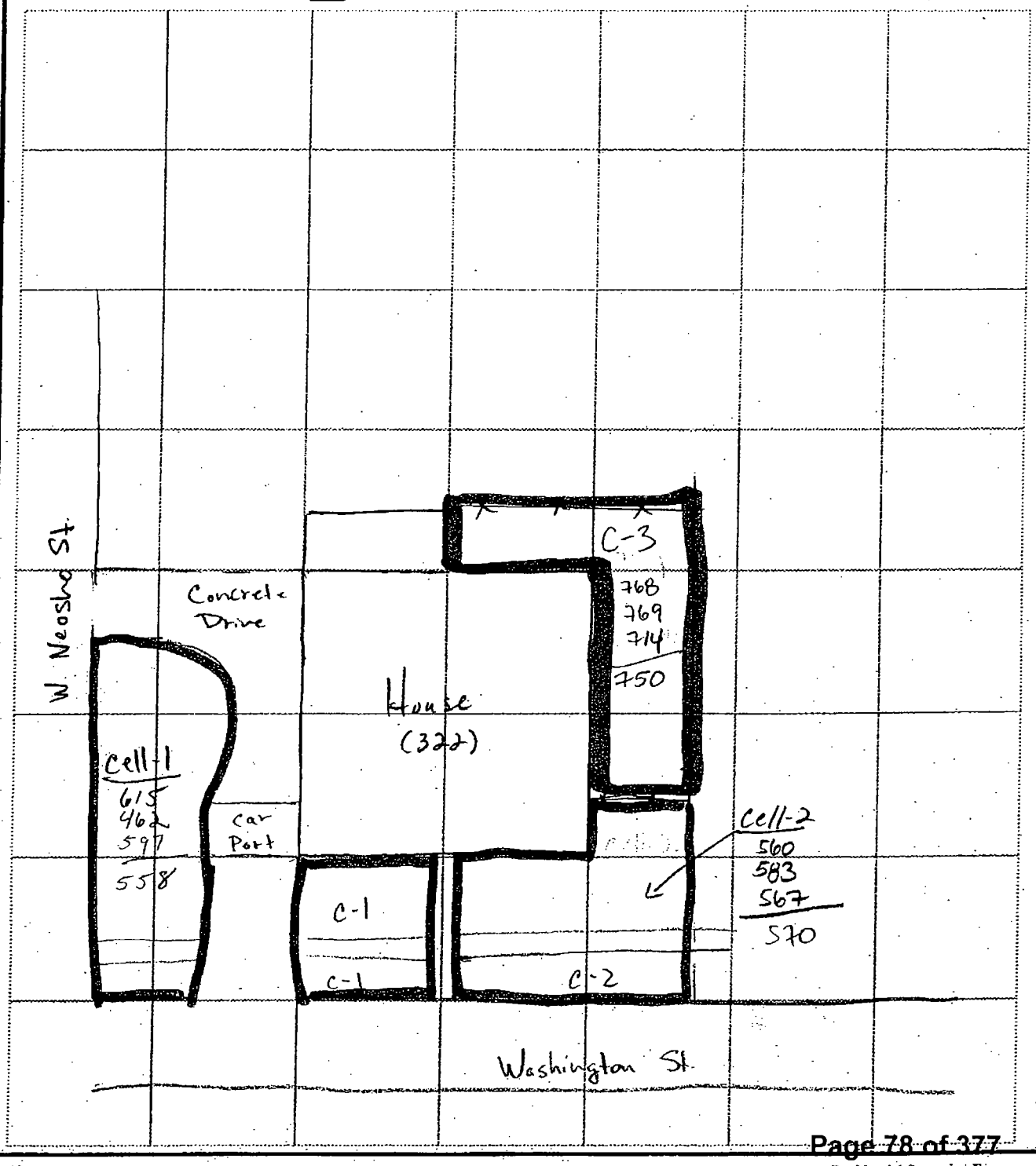
United Zinc # 1
Residential Property Screening Form
EPA Site # 397

Date(s): 6/19/06

Name: Shaun Powell
Address: 322 S. Washington
Iola, KS 66749
Phone # 620-228-1588
Owner Information on back: ___

	XRF I.D.	Operator
Screening Results:	62	BS
Post-Removal:		

Latitude 37.91912 North
Longitude 95.40563 West



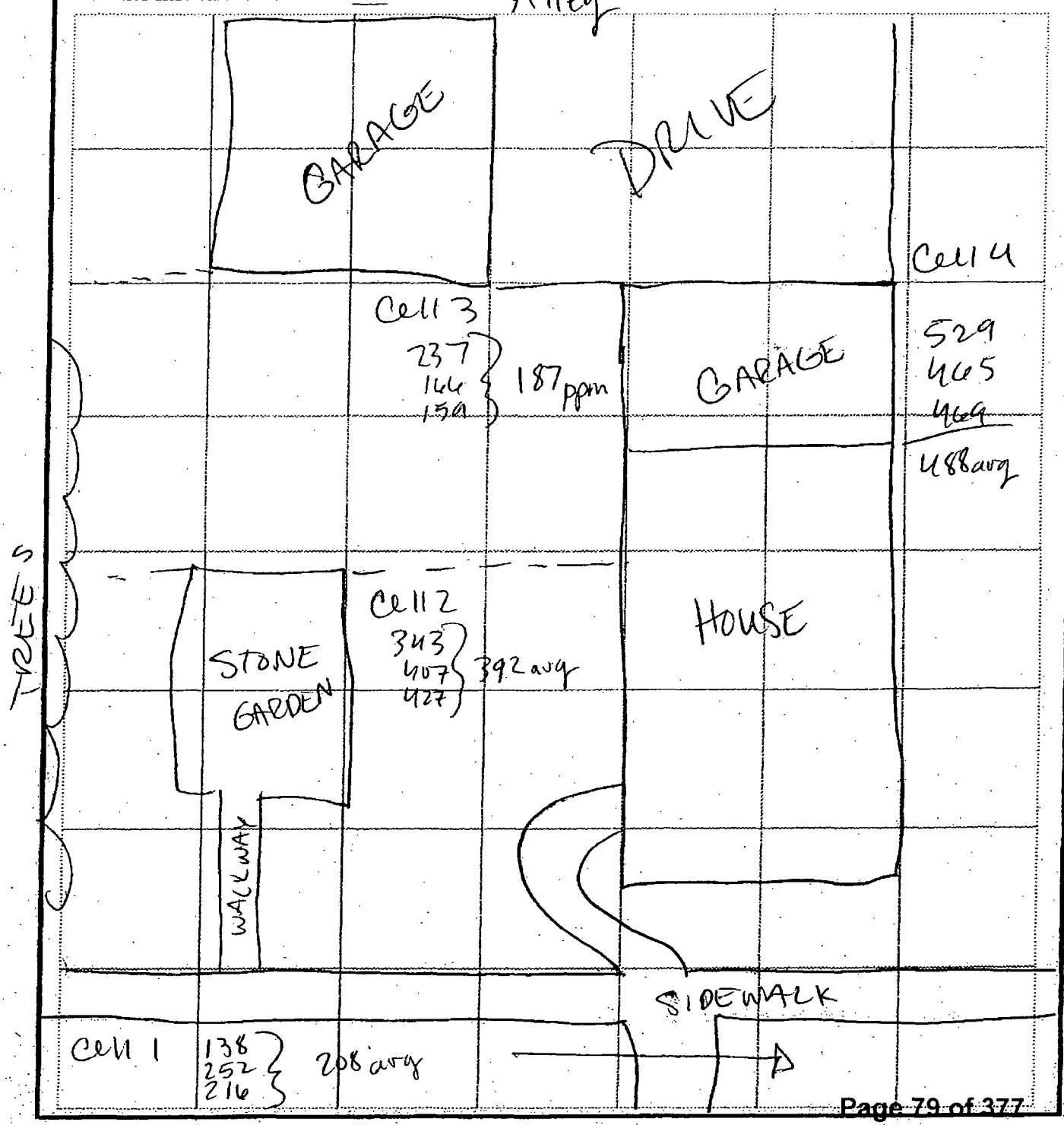
United Zinc # 1
Residential Property Screening Form
EPA Site # 400

Date(s): 10/19/06

Name: Robert Andrew Dunlap
Address: 812 N. Jefferson
Iola, KS 66749
Phone # 620-365-3882
Owner Information on back: ___

	XRF I.D.	Operator
Screening Results:	62	B.E.
Post-Removal:		

Latitude 37.92996°
Longitude -95.40337°



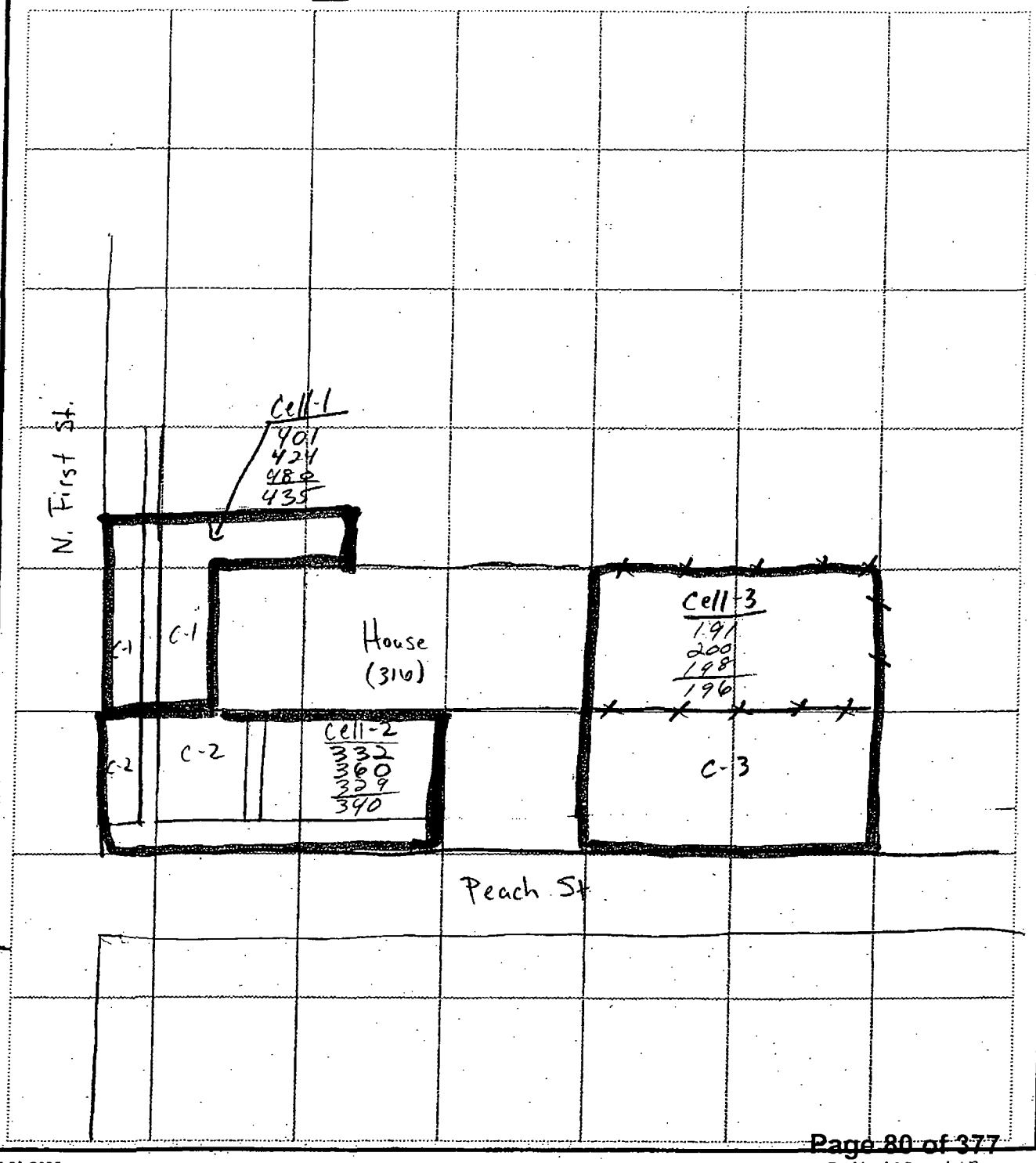
[illegible] Sample Cell #1

United Zinc # 1
Residential Property Screening Form
EPA Site # 404

Date(s): 9/20/06

		XRF I.D.	Operator
Name: Larry Cole	Screening Results:	58	BS
Address: 316 N 1st	Post-Removal:		
Iola, Ks 66749	Latitude	37.92569	
Phone # 620-365-2151	Longitude	-95.239548	

Owner Information on back: ___



07-01-2005

Residential Screening Form

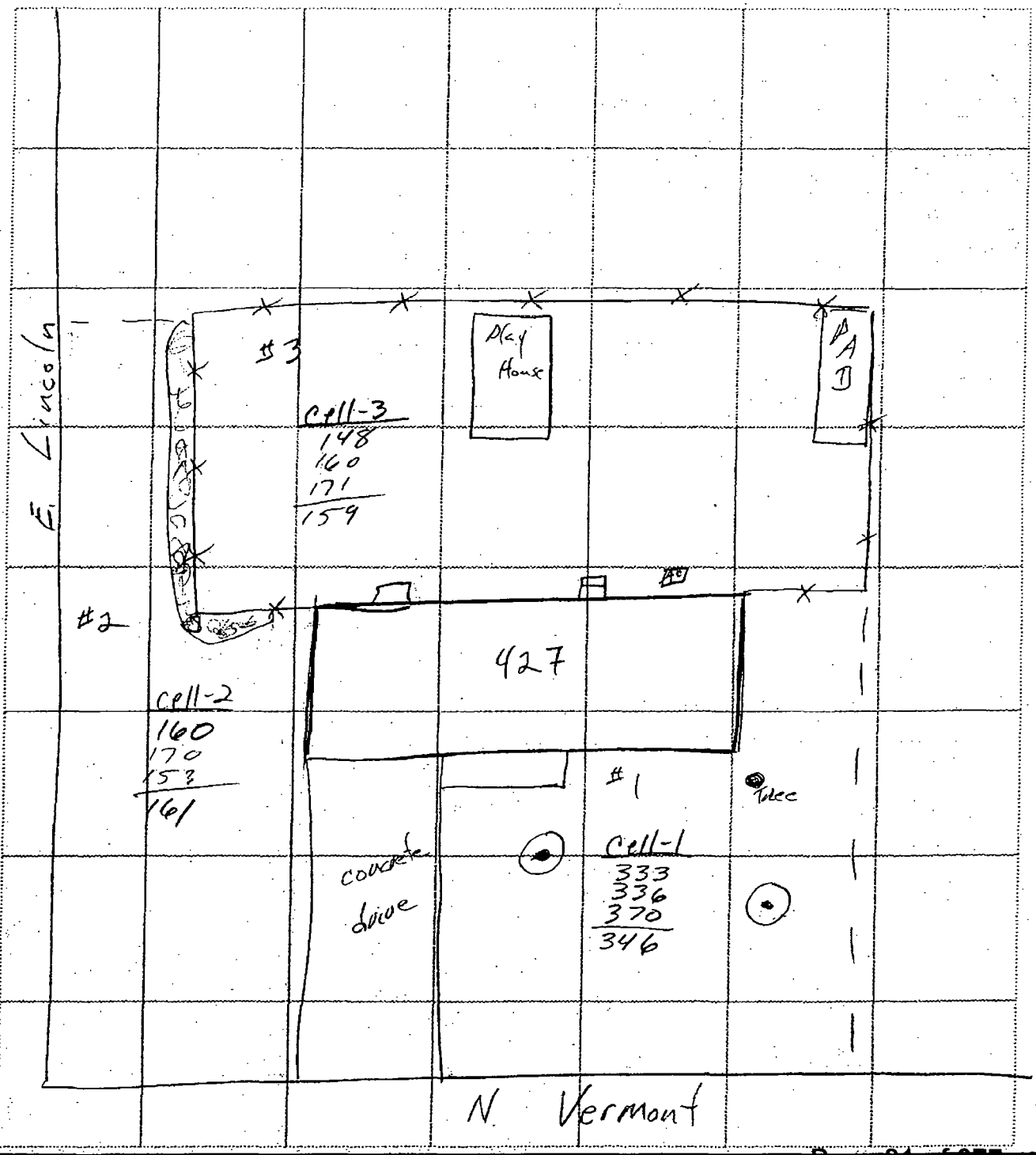
United Zinc # 1
Residential Property Screening Form
EPA Site # 406

Date(s): 9-20-06

Name: James + Nina Chandler
Address: 427 N. Vermont
Iola, KS 66749
Phone #
Owner Information on back: X

	XRF I.D.	Operator
Screening Results:	58	BS
Post-Removal:		

Latitude N 37.92725
Longitude W95.38740



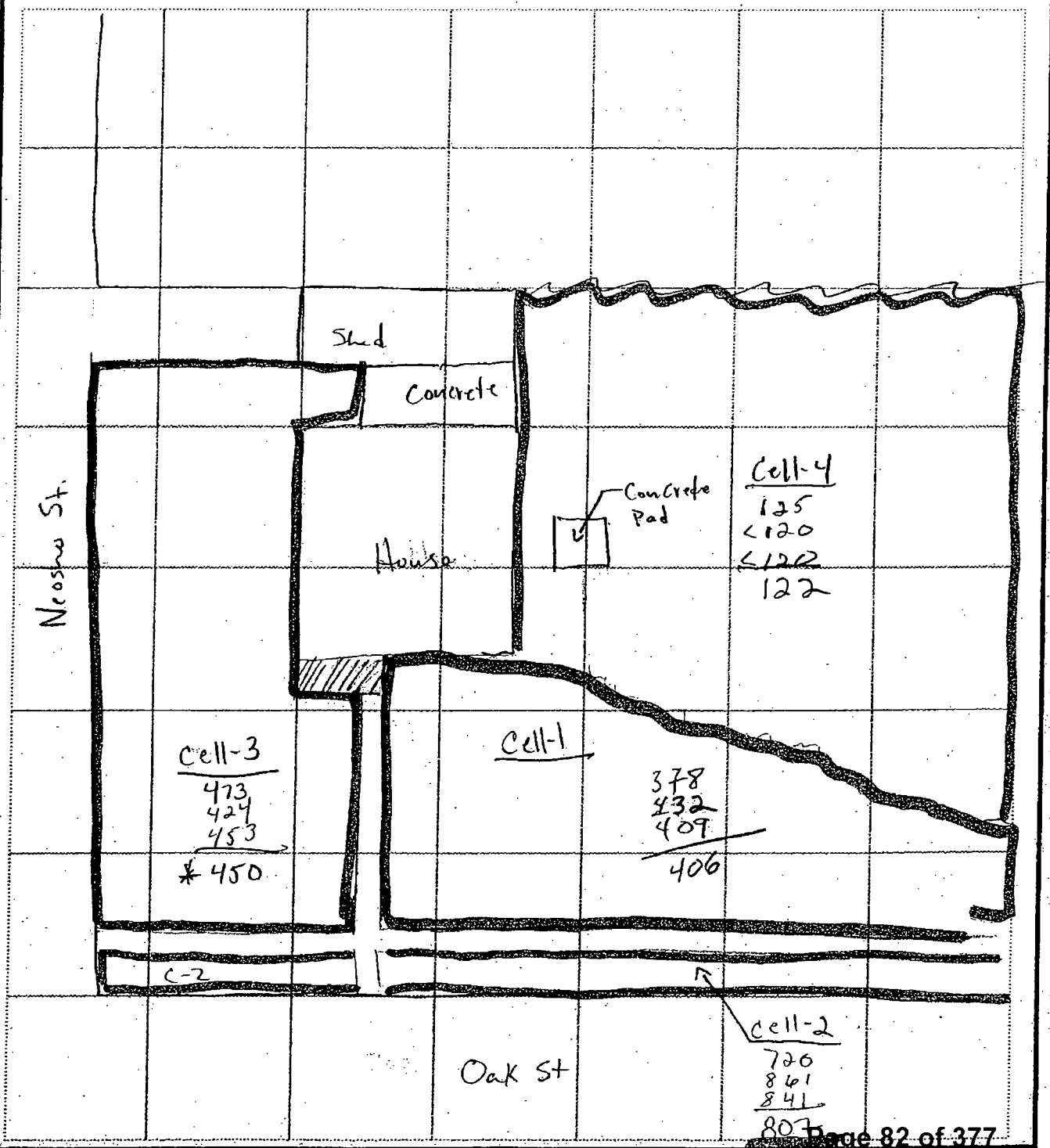
United Zinc # 1
Residential Property Screening Form
EPA Site # 408

Date(s): 6/19/06

Name: Rick Dennis
Address: 324 S. Oak
Iola, KS 66749
Phone #
Owner Information on back: X

	XRF I.D.	Operator
Screening Results:	62	RC
Post-Removal:		

Latitude 37.91910°
Longitude -95.39771°



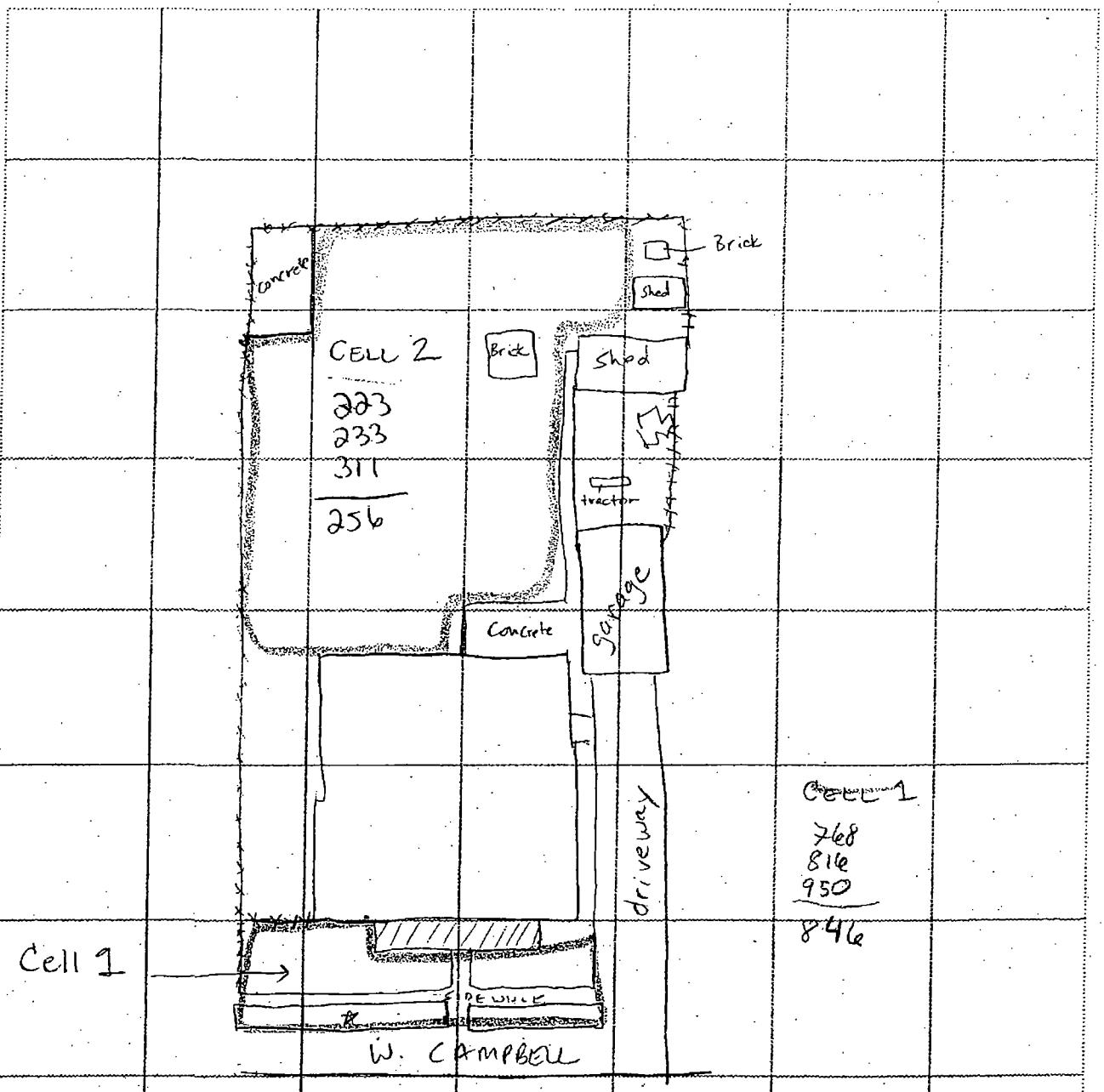
United Zinc # 1
Residential Property Screening Form
EPA Site # 411

Date(s): 9-27-06

	XRF I.D.	Operator
Screening Results:	ER-51	AH
Post-Removal:		

Name: Robert D. Lancaster
Address: 8 W. Campbell
Iola, Ks 66749
Phone # 620-365-3864
Owner Information on back: ___

Latitude 37.91935° N
Longitude 95.40991° W



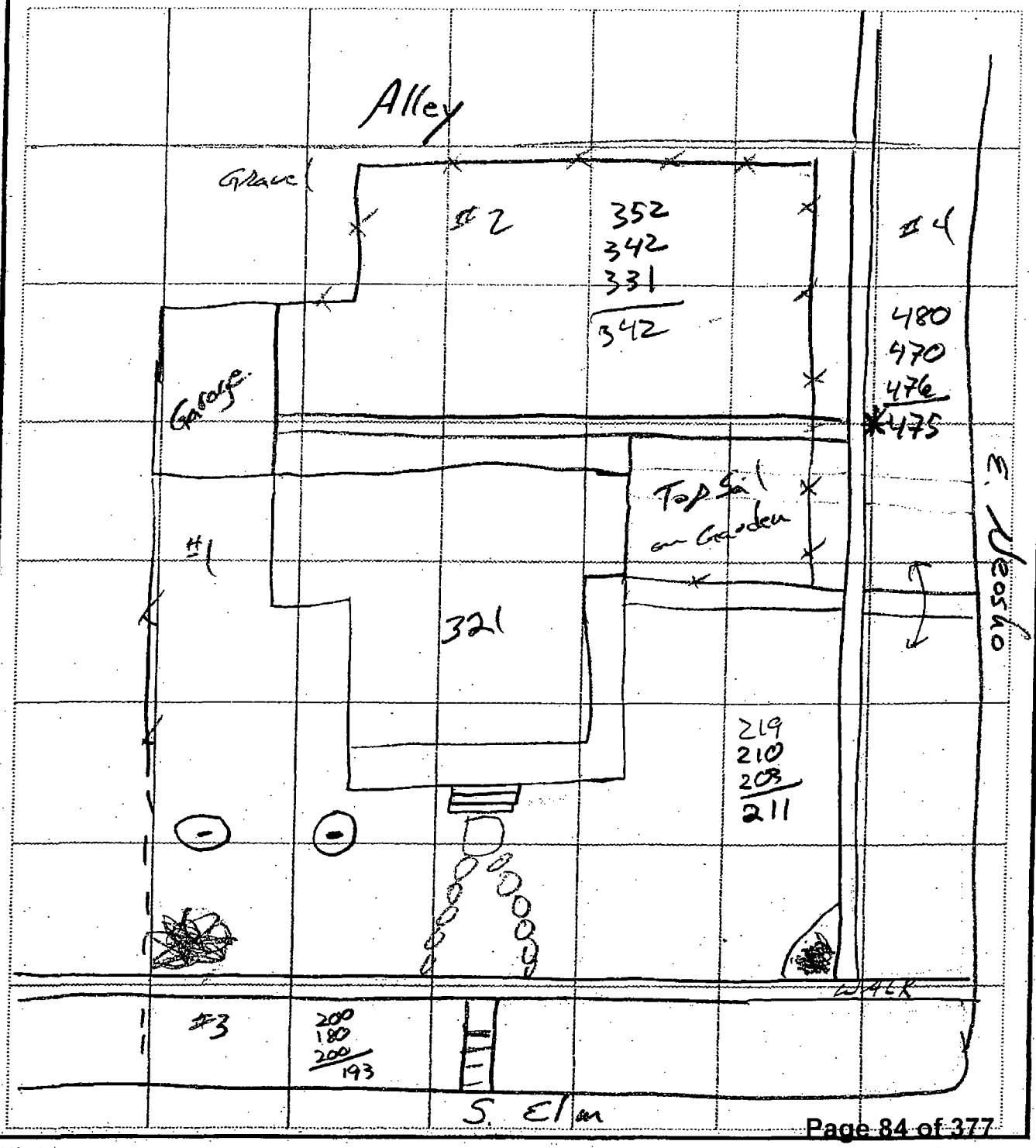
United Zinc # 1
Residential Property Screening Form
EPA Site # 414

Date(s): 9/18/05

Name: Sam Shallah
Address: 321 S. Elm St.
Iola, KS 66749
Phone #
Owner Information on back:

	XRF I.D.	Operator
Screening Results:	58	AH
Post-Removal:		

Latitude N37.91912
Longitude W95.39644



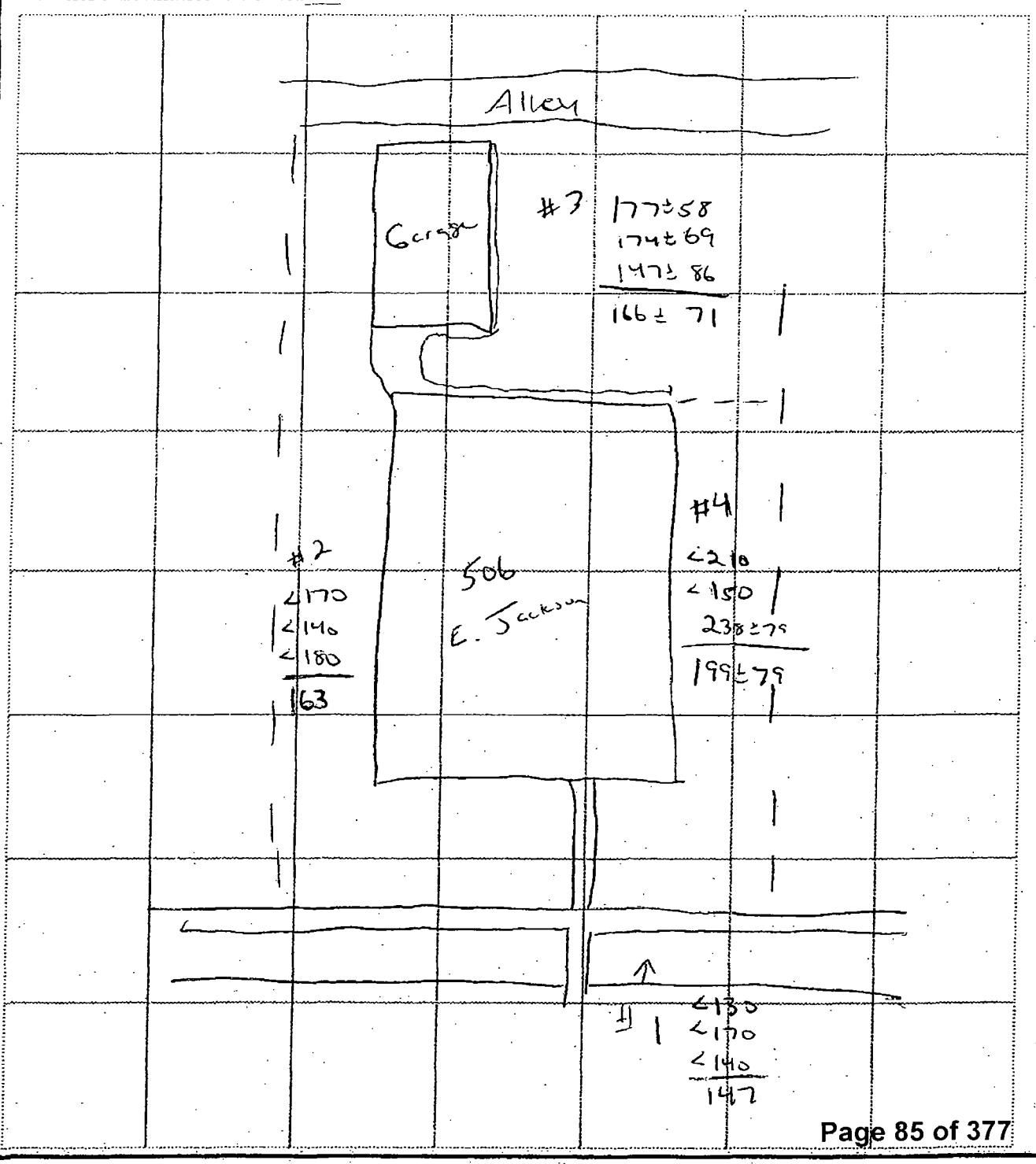
United Zinc # 1
Residential Property Screening Form
EPA Site # 416

Date(s): 9-25-06

Name: Lorene Butler
Address: 506 E. Jackson
Iola, KS 66749
Phone # 620-365-2060
Owner Information on back: ___

	XRF I.D.	Operator
Screening Results:	62	JS / BE
Post-Removal:		

Latitude 37.92313 N
Longitude 95.39790 W.



APPENDIX C

FIELD SHEETS AND CHAIN-OF-CUSTODY RECORDS

CHAIN OF CUSTODY RECORD
ENVIRONMENTAL PROTECTION AGENCY REGION VII

ACTIVITY LEADER(Print)	NAME OF SURVEY OR ACTIVITY	DATE OF COLLECTION (DAY MONTH YEAR)	SHEET
Eddie McGlasson	United Zinc #1	8-16-08 06	1 of 1

CONTENTS OF SHIPMENT

SAMPLE NUMBER	TYPE OF CONTAINERS: CUBITAINER	8 oz BOTTLE	BOTTLE	BOTTLE	VOA SET (2 VIALS EA)	SAMPLED MEDIA: water	soil	sediment	dust	other	RECEIVING LABORATORY REMARKS/OTHER INFORMATION (condition of samples upon receipt, other sample numbers, etc.)
	NUMBERS OF CONTAINERS PER SAMPLE NUMBER										
365(-1		1					X				
2		1					X				
3		1					X				
4		1					X				
5		1					X				
6		1					X				
7		1					X				
8		1					X				
9		1					X				
10		1					X				
11		1					X				
12		1					X				

Nothing More to Follow

DESCRIPTION OF SHIPMENT

_____ PIECE(S) CONSISTING OF _____ BOX(ES)

1 ICE CHEST(S); OTHER _____

MODE OF SHIPMENT

_____ COMMERCIAL CARRIER: _____

_____ COURIER

X SAMPLER CONVEYED

_____ (SHIPPING DOCUMENT NUMBER)

PERSONNEL CUSTODY RECORD

RELINQUISHED BY (SAMPLER)	DATE	TIME	RECEIVED BY	REASON FOR CHANGE OF CUSTODY
[signature] SEALED ☐ UNSEALED ☒	8/16/06	1221	SEALED ☐ UNSEALED ☐	
RELINQUISHED BY SEALED ☐ UNSEALED ☐	DATE	TIME	RECEIVED BY SEALED ☐ UNSEALED ☐	REASON FOR CHANGE OF CUSTODY
RELINQUISHED BY SEALED ☐ UNSEALED ☐	DATE	TIME	RECEIVED BY SEALED ☐ UNSEALED ☐	REASON FOR CHANGE OF CUSTODY

7-EPA-9262(Revised 5/85)

*U.S. GPO: 2002-756-917/40053

Sample Collection Field Sheet
US EPA Region 7
Kansas City, KS

ASR Number: 3151 **Sample Number:** 1 **QC Code:** __ **Matrix:** Solid **Tag ID:** 3151-1-__

Project ID: EMA78Q00 **Project Manager:** Eddie McGlasson
Project Desc: United Zinc No. 1 site sampling
City: Iola **State:** Kansas
Program: Superfund
Site Name: United Zinc No. 1 - **Site ID:** A78Q **Site OU:** 00

Location Desc: EPA 270 C #2

External Sample Number: _____

Expected Conc: (or Circle One: Low Medium High) **Date** **Time(24 hr)**

Latitude: ___ ___ ___ **Sample Collection: Start:** 8/15/06 10:10
Longitude: ___ ___ ___ **End:** __/__/__ __:__

Laboratory Analyses:

Container	Preservative	Holding Time	Analysis
1 - 8 oz glass	4 Deg C	180 Days	1 Metals in Solids by ICP

Sample Comments:
(N/A)

510 S Sycamore

Sample Collected By: ~~BG~~ AA

Sample Collection Field Sheet
US EPA Region 7
Kansas City, KS

ASR Number: 3151 **Sample Number:** 2 **QC Code:** __ **Matrix:** Solid **Tag ID:** 3151-2-__

Project ID: EMA78Q00 **Project Manager:** Eddie McGlasson
Project Desc: United Zinc No. 1 site sampling
City: Iola **State:** Kansas
Program: Superfund
Site Name: United Zinc No. 1 - **Site ID:** A78Q **Site OU:** 00

Location Desc: EPA 64 C#1

External Sample Number: _____

Expected Conc: (or Circle One: Low Medium High) **Date** **Time(24 hr)**

Latitude: ___ ___ ___ **Sample Collection: Start:** 8/8/06 10:05
Longitude: ___ ___ ___ **End:** __/__/__ __:__

Laboratory Analyses:

Container	Preservative	Holding Time	Analysis
1 - 8 oz glass	4 Deg C	180 Days	1 Metals in Solids by ICP

Sample Comments:
(N/A) 910 N. Walnut

Sample Collected By: RCAH

Sample Collection Field Sheet
US EPA Region 7
Kansas City, KS

ASR Number: 3151 **Sample Number:** 3 **QC Code:** __ **Matrix:** Solid **Tag ID:** 3151-3-__

Project ID: EMA78Q00 **Project Manager:** Eddie McGlasson
Project Desc: United Zinc No. 1 site sampling
City: Iola **State:** Kansas
Program: Superfund
Site Name: United Zinc No. 1 - **Site ID:** A78Q **Site OU:** 00

Location Desc: EPA #102 C# 2

External Sample Number: _____

Expected Conc: (or Circle One: Low Medium High) **Date** **Time(24 hr)**

Latitude: ___ ___ ___ **Sample Collection: Start:** 8/8/06 09:05
Longitude: ___ ___ ___ **End:** __/__/__ __:__

Laboratory Analyses:

Container	Preservative	Holding Time	Analysis
1 - 8 oz glass	4 Deg C	180 Days	1 Metals in Solids by ICP

Sample Comments:
(N/A) 416 E. Jackson

Sample Collected By: ~~RE~~ AH

Sample Collection Field Sheet
US EPA Region 7
Kansas City, KS

ASR Number: 3151 **Sample Number:** 4 **QC Code:** __ **Matrix:** Solid **Tag ID:** 3151-4-__

Project ID: EMA78Q00 **Project Manager:** Eddie McGlasson
Project Desc: United Zinc No. 1 site sampling
City: Iola **State:** Kansas
Program: Superfund
Site Name: United Zinc No. 1 - **Site ID:** A78Q **Site OU:** 00

Location Desc: EPA 76 C #3

External Sample Number: _____

Expected Conc: (or Circle One: Low Medium High) **Date** **Time(24 hr)**

Latitude: ___ ___ ___ **Sample Collection: Start:** 8/8/06 09:53
Longitude: ___ ___ ___ **End:** __/__/__ __:__

Laboratory Analyses:

Container	Preservative	Holding Time	Analysis
1 - 8 oz glass	4 Deg C	180 Days	1 Metals in Solids by ICP

Sample Comments:
(N/A)

812 N. Walnut

Sample Collected By: ~~BC~~ A H

Sample Collection Field Sheet
US EPA Region 7
Kansas City, KS

ASR Number: 3151 **Sample Number:** 5 **QC Code:** __ **Matrix:** Solid **Tag ID:** 3151-5-__

Project ID: EMA78Q00 **Project Manager:** Eddie McGlasson
Project Desc: United Zinc No. 1 site sampling
City: Iola **State:** Kansas
Program: Superfund
Site Name: United Zinc No. 1 - **Site ID:** A78Q **Site OU:** 00

Location Desc: EPA 183 C #1

External Sample Number: _____

Expected Conc: (or Circle One: Low Medium High) **Date** **Time(24 hr)**

Latitude: ___ ___ ___ **Sample Collection: Start:** 8/8/06 08:45
Longitude: ___ ___ ___ **End:** __/__/__ __:__

Laboratory Analyses:

Container	Preservative	Holding Time	Analysis
1 - 8 oz glass	4 Deg C	180 Days	1 Metals in Solids by ICP

Sample Comments:
(N/A)

402 S Sycamore

Sample Collected By: ~~RC~~ AH

Sample Collection Field Sheet
US EPA Region 7
Kansas City, KS

ASR Number: 3151 **Sample Number:** 6 **QC Code:** __ **Matrix:** Solid **Tag ID:** 3151-6-__

Project ID: EMA78Q00 **Project Manager:** Eddie McGlasson
Project Desc: United Zinc No. 1 site sampling
City: Iola **State:** Kansas
Program: Superfund
Site Name: United Zinc No. 1 - **Site ID:** A78Q **Site OU:** 00

Location Desc: EPA26 C #1

External Sample Number: _____

Expected Conc: (or Circle One: Low Medium High) **Date** **Time(24 hr)**

Latitude: ___ ___ ___ **Sample Collection: Start:** 8/9/06 10:45
Longitude: ___ ___ ___ **End:** __/__/__ __:__

Laboratory Analyses:

Container	Preservative	Holding Time	Analysis
1 - 8 oz glass	4 Deg C	180 Days	1 Metals in Solids by ICP

Sample Comments:
(N/A)

Glade
507 S. Jefferson

Sample Collected By: RC

Sample Collection Field Sheet
US EPA Region 7
Kansas City, KS

ASR Number: 3151 **Sample Number:** 7 **QC Code:** __ **Matrix:** Solid **Tag ID:** 3151-7-__

Project ID: EMA78Q00 **Project Manager:** Eddie McGlasson
Project Desc: United Zinc No. 1 site sampling
City: Iola **State:** Kansas
Program: Superfund
Site Name: United Zinc No. 1 - **Site ID:** A78Q **Site OU:** 00

Location Desc: EPA 266 C #1

External Sample Number: _____

Expected Conc: (or Circle One: Low Medium High)

		Date	Time(24 hr)
Latitude: ___ ___ ___	**Sample Collection: Start:**	8/9/06	14:50
Longitude: ___ ___ ___	**End:**	__/__/__	__:__

Laboratory Analyses:

Container	Preservative	Holding Time	Analysis
1 - 8 oz glass	4 Deg C	180 Days	1 Metals In Solids by ICP

Sample Comments:
(N/A)

415 S. Sycamore

Sample Collected By: RC

Sample Collection Field Sheet
US EPA Region 7
Kansas City, KS

ASR Number: 3151 **Sample Number:** 8 **QC Code:** __ **Matrix:** Solid **Tag ID:** 3151-8-__

Project ID: EMA78Q00 **Project Manager:** Eddie McGlasson
Project Desc: United Zinc No. 1 site sampling
City: Iola **State:** Kansas
Program: Superfund
Site Name: United Zinc No. 1 - **Site ID:** A78Q **Site OU:** 00

Location Desc: EPA 260 C #1

External Sample Number: _____

Expected Conc: (or Circle One: Low Medium High) **Date** **Time(24 hr)**

Latitude: ___ ___ ___ **Sample Collection: Start:** 8/9/06 10:00
Longitude: ___ ___ ___ **End:** __/__/__ __:__

Laboratory Analyses:

Container	Preservative	Holding Time	Analysis
1 - 8 oz glass	4 Deg C	180 Days	1 Metals in Solids by ICP

Sample Comments:
(N/A)

615 S. Jefferson

Sample Collected By: RC

Sample Collection Field Sheet
US EPA Region 7
Kansas City, KS

ASR Number: 3151 **Sample Number:** 9 **QC Code:** __ **Matrix:** Solid **Tag ID:** 3151-9-__

Project ID: EMA78Q00 **Project Manager:** Eddie McGlasson
Project Desc: United Zinc No. 1 site sampling
City: Iola **State:** Kansas
Program: Superfund
Site Name: United Zinc No. 1 - **Site ID:** A78Q **Site OU:** 00

Location Desc: EPA 268 C52

External Sample Number: _____

Expected Conc: (or Circle One: Low Medium High) **Date** **Time(24 hr)**

Latitude: ___ ___ ___ **Sample Collection: Start:** 8/9/06 16:40
Longitude: ___ ___ ___ **End:** __/__/__ __:__

Laboratory Analyses:

Container	Preservative	Holding Time	Analysis
1 - 8 oz glass	4 Deg C	180 Days	1 Metals in Solids by ICP

Sample Comments:
(N/A) 502 S. Sycamore

Sample Collected By: RC

Sample Collection Field Sheet
US EPA Region 7
Kansas City, KS

ASR Number: 3151 **Sample Number:** 10 **QC Code:** __ **Matrix:** Solid **Tag ID:** 3151-10-__

Project ID: EMA78Q00 **Project Manager:** Eddie McGlasson
Project Desc: United Zinc No. 1 site sampling
City: Iola **State:** Kansas
Program: Superfund
Site Name: United Zinc No. 1 - **Site ID:** A78Q **Site OU:** 00

Location Desc: EPA ~~160~~ 262 C II ~~2~~ 4

External Sample Number: _____

Expected Conc: (or Circle One: Low Medium High)

		Date	Time(24 hr)
Latitude: ___ ___ ___	**Sample Collection: Start:**	8/9/06	~~09:50~~ 11:30
Longitude: ___ ___ ___	**End:**	__/__/__	__:__

Laboratory Analyses:

Container	Preservative	Holding Time	Analysis
1 - 8 oz glass	4 Deg C	180 Days	1 Metals in Solids by ICP

Sample Comments:
(N/A)

~~GFF~~ 420 S. Jefferson

Sample Collected By: RC

Sample Collection Field Sheet
US EPA Region 7
Kansas City, KS

ASR Number: 3151 **Sample Number:** 11 **QC Code:** __ **Matrix:** Solid **Tag ID:** 3151-11-__

Project ID: EMA78Q00 **Project Manager:** Eddie McGlasson
Project Desc: United Zinc No. 1 site sampling
City: Iola **State:** Kansas
Program: Superfund
Site Name: United Zinc No. 1 - **Site ID:** A78Q **Site OU:** 00

Location Desc: EPA 2 C #

External Sample Number: _____

Expected Conc: (or Circle One: Low Medium High) **Date** **Time(24 hr)**

Latitude: ___ ___ ___ **Sample Collection: Start:** 8/16/06 08:10
Longitude: ___ ___ ___ **End:** __/__/__ __:__

Laboratory Analyses:

Container	Preservative	Holding Time	Analysis
1 - 8 oz glass	4 Deg C	180 Days	1 Metals in Solids by ICP

Sample Comments:
(N/A)

204 S. Kentucky

Post-Ex.

Sample Collected By: RC

Sample Collection Field Sheet
US EPA Region 7
Kansas City, KS

ASR Number: 3151 **Sample Number:** 12 **QC Code:** __ **Matrix:** Solid **Tag ID:** 3151-12-__

Project ID: EMA78Q00 **Project Manager:** Eddie McGlasson
Project Desc: United Zinc No. 1 site sampling
City: Iola **State:** Kansas
Program: Superfund
Site Name: United Zinc No. 1 - **Site ID:** A78Q **Site OU:** 00

Location Desc: Backfill

External Sample Number: _____

Expected Conc: (or Circle One: Low Medium High) **Date** **Time(24 hr)**

Latitude: ___ ___ ___ **Sample Collection: Start:** 8/16/06 07:45
Longitude: ___ ___ ___ **End:** __/__/__ __:__

Laboratory Analyses:

Container	Preservative	Holding Time	Analysis
1 - 8 oz glass	4 Deg C	180 Days	1 Metals in Solids by ICP

Sample Comments:
(N/A)

Sample Collected By: RC

CHAIN OF CUSTODY RECORD
ENVIRONMENTAL PROTECTION AGENCY REGION VII

ACTIVITY LEADER(Print)	NAME OF SURVEY OR ACTIVITY	DATE OF COLLECTION (DAY / MONTH / YEAR)	SHEET
Eddie McGlasson	United Zinc No. 1	19-31 / 08 / 06	1 of 1

CONTENTS OF SHIPMENT

SAMPLE NUMBER EMA78Q00	TYPE OF CONTAINERS: CUBITAINER	BOTTLE	BOTTLE	BOTTLE	VOA SET (2 VIALS EA)	SAMPLED MEDIA: water	soil	sediment	dust	other	RECEIVING LABORATORY REMARKS/OTHER INFORMATION (condition of samples upon receipt, other sample numbers, etc.)
	NUMBERS OF CONTAINERS PER SAMPLE NUMBER										
3152-1		1					X				
2		1					X				
3		1					X				
4		1					X				
5		1					X				
6		1					X				
7		1					X				
8		1					X				
9		1					X				
10		1					X				
11		1					X				
12		1					X				
13		1					X				
14		1					X				
15		1					X				
16		1					X				
17		1					X				
18		1					X				
19		1					X				
20		1					X				
		Nothing Made to Forward									

DESCRIPTION OF SHIPMENT

_____ PIECE(S) CONSISTING OF 1 BOX(ES)

_____ ICE CHEST(S): OTHER _____

MODE OF SHIPMENT

_____ COMMERCIAL CARRIER: _____

_____ COURIER

X SAMPLER CONVEYED

_____ (SHIPPING DOCUMENT NUMBER)

PERSONNEL CUSTODY RECORD

RELINQUISHED BY (SAMPLER)	DATE	TIME	RECEIVED BY	REASON FOR CHANGE OF CUSTODY
[signature] SEALED ☐ UNSEALED ☒	9/1/06	1357	[signature] SEALED ☐ UNSEALED ☐	Del. to Lab
RELINQUISHED BY SEALED ☐ UNSEALED ☐	DATE	TIME	RECEIVED BY SEALED ☐ UNSEALED ☐	REASON FOR CHANGE OF CUSTODY
RELINQUISHED BY SEALED ☐ UNSEALED ☐	DATE	TIME	RECEIVED BY SEALED ☐ UNSEALED ☐	REASON FOR CHANGE OF CUSTODY

7-EPA-9262(Revised 5/85)

*U.S. GPO: 2002-756-917/40053

Sample Collection Field Sheet
US EPA Region 7
Kansas City, KS

ASR Number: 3152 **Sample Number:** 1 **QC Code:** __ **Matrix:** Solid **Tag ID:** 3152-1-__

Project ID: EMA78Q00 **Project Manager:** Eddie McGlasson
Project Desc: United Zinc No. 1 site sampling
City: Iola **State:** Kansas
Program: Superfund
Site Name: United Zinc No. 1 **Site ID:** A78Q **Site OU:** 00

Location Desc: EPA 25 of C #1

External Sample Number: _____

Expected Conc: (or Circle One: Low Medium High) **Date** **Time(24 hr)**

Latitude: ___ ___ ___ **Sample Collection: Start:** 8/17/06 10:00
Longitude: ___ ___ ___ **End:** __/__/__ __:__

Laboratory Analyses:

Container	Preservative	Holding Time	Analysis
1 - 8 oz glass	4 Deg C	180 Days	1 Metals in Solids by ICP

Sample Comments:
(N/A)

326 S. 2nd St

Sample Collected By: RC

Sample Collection Field Sheet
US EPA Region 7
Kansas City, KS

ASR Number: 3152 **Sample Number:** 2 **QC Code:** __ **Matrix:** Solid **Tag ID:** 3152-2-__

Project ID: EMA78Q00 **Project Manager:** Eddie McGlasson
Project Desc: United Zinc No. 1 site sampling
City: Iola **State:** Kansas
Program: Superfund
Site Name: United Zinc No. 1 - **Site ID:** A78Q **Site OU:** 00

Location Desc: EPA 285 C #1

External Sample Number: _____

Expected Conc: (or Circle One: Low Medium High) **Date** **Time(24 hr)**

Latitude: ___ ___ ___ **Sample Collection: Start:** 8/21/06 15:35
Longitude: ___ ___ ___ **End:** __/__/__ __:__

Laboratory Analyses:

Container	Preservative	Holding Time	Analysis
1 - 8 oz glass	4 Deg C	180 Days	1 Metals in Solids by ICP

Sample Comments:
(N/A)

517 S. Sycamore

Sample Collected By: ~~BE~~ AH

Sample Collection Field Sheet
US EPA Region 7
Kansas City, KS

ASR Number: 3152 **Sample Number:** 3 **QC Code:** __ **Matrix:** Solid **Tag ID:** 3152-3-__

Project ID: EMA78Q00 **Project Manager:** Eddie McGlasson
Project Desc: United Zinc No. 1 site sampling
City: Iola **State:** Kansas
Program: Superfund
Site Name: United Zinc No. 1 - **Site ID:** A78Q **Site OU:** 00

Location Desc: EPA 298 C#1

External Sample Number: _____

Expected Conc: (or Circle One: Low Medium High) **Date** **Time(24 hr)**

Latitude: ___ ___ ___ **Sample Collection: Start:** 8/22/06 09:30
Longitude: ___ ___ ___ **End:** __/__/__ __:__

Laboratory Analyses:

Container	Preservative	Holding Time	Analysis
1 - 8 oz glass	4 Deg C	180 Days	1 Metals in Solids by ICP

Sample Comments:
(N/A)

319 S. Sycamore

Sample Collected By: ~~RC~~ AKA

Sample Collection Field Sheet
US EPA Region 7
Kansas City, KS

ASR Number: 3152 **Sample Number:** 4 **QC Code:** __ **Matrix:** Solid **Tag ID:** 3152-4-__

Project ID: EMA78Q00 **Project Manager:** Eddie McGlasson
Project Desc: United Zinc No. 1 site sampling
City: Iola **State:** Kansas
Program: Superfund
Site Name: United Zinc No. 1 - **Site ID:** A78Q **Site OU:** 00

Location Desc: EPA 295 C-1

External Sample Number: _____

Expected Conc: (or Circle One: Low Medium High) **Date** **Time(24 hr)**

Latitude: ___ ___ ___ **Sample Collection: Start:** 8/22/06 10:00
Longitude: ___ ___ ___ **End:** __/__/__ __:__

Laboratory Analyses:

Container	Preservative	Holding Time	Analysis
1 - 8 oz glass	4 Deg C	180 Days	1 Metals in Solids by ICP

Sample Comments:
(N/A) 307 S. Sycamore

Sample Collected By: RC

Sample Collection Field Sheet
US EPA Region 7
Kansas City, KS

ASR Number: 3152 **Sample Number:** 5 **QC Code:** __ **Matrix:** Solid **Tag ID:** 3152-5-__

Project ID: EMA78Q00 **Project Manager:** Eddie McGlasson
Project Desc: United Zinc No. 1 site sampling
City: Iola **State:** Kansas
Program: Superfund
Site Name: United Zinc No. 1 - **Site ID:** A78Q **Site OU:** 00

Location Desc: EPA 274 C#2

External Sample Number: _____

Expected Conc: (or Circle One: Low Medium High)

		Date	Time(24 hr)
Latitude: ___ ___ ___	**Sample Collection: Start:**	8/16/06	14:10
Longitude: ___ ___ ___	**End:**	__/__/__	__:__

Laboratory Analyses:

Container	Preservative	Holding Time	Analysis
1 - 8 oz glass	4 Deg C	180 Days	1 Metals in Solids by ICP

Sample Comments:
(N/A) 623 S. Sycamore

Sample Collected By: RC

Sample Collection Field Sheet
US EPA Region 7
Kansas City, KS

ASR Number: 3152 **Sample Number:** 6 **QC Code:** __ **Matrix:** Solid **Tag ID:** 3152-6-__

Project ID: EMA78Q00 **Project Manager:** Eddie McGlasson
Project Desc: United Zinc No. 1 site sampling
City: Iola **State:** Kansas
Program: Superfund
Site Name: United Zinc No. 1 - **Site ID:** A78Q **Site OU:** 00

Location Desc: EPA 3 C #7

External Sample Number: _____

Expected Conc: (or Circle One: Low Medium High) **Date** **Time(24 hr)**

Latitude: ___ ___ ___ **Sample Collection: Start:** 8/16/__ 11:50
Longitude: ___ ___ ___ **End:** __/__/__ __:__

Laboratory Analyses:

Container	Preservative	Holding Time	Analysis
1 - 8 oz glass	4 Deg C	180 Days	1 Metals in Solids by ICP

Sample Comments:
(N/A)

300 S. Jefferson

Sample Collected By: RC

Sample Collection Field Sheet
US EPA Region 7
Kansas City, KS

ASR Number: 3152 **Sample Number:** 7 **QC Code:** __ **Matrix:** Solid **Tag ID:** 3152-7-__

Project ID: EMA78Q00 **Project Manager:** Eddie McGlasson
Project Desc: United Zinc No. 1 site sampling
City: Iola **State:** Kansas
Program: Superfund
Site Name: United Zinc No. 1 - **Site ID:** A78Q **Site OU:** 00

Location Desc: EPA297 C#1

External Sample Number: _____

Expected Conc: (or Circle One: Low Medium High) **Date** **Time(24 hr)**

Latitude: ___ ___ ___ **Sample Collection: Start:** 8/23/06 15:10
Longitude: ___ ___ ___ **End:** __/__/__ __:__

Laboratory Analyses:

Container	Preservative	Holding Time	Analysis
1 - 8 oz glass	4 Deg C	180 Days	1 Metals in Solids by ICP

Sample Comments:
(N/A) 224 S. Jefferson

Sample Collected By: ~~RC~~ AH

Sample Collection Field Sheet
US EPA Region 7
Kansas City, KS

ASR Number: 3152 **Sample Number:** 8 **QC Code:** __ **Matrix:** Solid **Tag ID:** 3152-8-__

Project ID: EMA78Q00 **Project Manager:** Eddie McGlasson
Project Desc: United Zinc No. 1 site sampling
City: Iola **State:** Kansas
Program: Superfund
Site Name: United Zinc No. 1 - **Site ID:** A78Q **Site OU:** 00

Location Desc: EPA 299 C #2

External Sample Number: _____

Expected Conc: (or Circle One: Low Medium High) **Date** **Time(24 hr)**

Latitude: ___ ___ ___ **Sample Collection: Start:** 8/24/06 11:25
Longitude: ___ ___ ___ **End:** __/__/__ __:__

Laboratory Analyses:

Container	Preservative	Holding Time	Analysis
1 - 8 oz glass	4 Deg C	180 Days	1 Metals in Solids by ICP

Sample Comments:
(N/A)

309 East St

Sample Collected By: ~~RC~~ AH

Sample Collection Field Sheet
US EPA Region 7
Kansas City, KS

ASR Number: 3152 **Sample Number:** 9 **QC Code:** __ **Matrix:** Solid **Tag ID:** 3152-9-__

Project ID: EMA78Q00 **Project Manager:** Eddie McGlasson
Project Desc: United Zinc No. 1 site sampling
City: Iola **State:** Kansas
Program: Superfund
Site Name: United Zinc No. 1 - **Site ID:** A78Q **Site OU:** 00

Location Desc: EPA 49 C #2

External Sample Number: _____

Expected Conc: (or Circle One: Low Medium High) **Date** **Time(24 hr)**

Latitude: __ __ __ **Sample Collection: Start:** 8/24/06 14:30
Longitude: __ __ __ **End:** __/__/__ __:__

Laboratory Analyses:

Container	Preservative	Holding Time	Analysis
1 - 8 oz glass	4 Deg C	180 Days	1 Metals in Solids by ICP

Sample Comments:
(N/A) 801 E. Jackson

Sample Collected By: ~~RC~~ AH

Sample Collection Field Sheet
US EPA Region 7
Kansas City, KS

ASR Number: 3152 **Sample Number:** 10 **QC Code:** __ **Matrix:** Solid **Tag ID:** 3152-10-__

Project ID: EMA78Q00 **Project Manager:** Eddie McGlasson
Project Desc: United Zinc No. 1 site sampling
City: Iola **State:** Kansas
Program: Superfund
Site Name: United Zinc No. 1 - **Site ID:** A78Q **Site OU:** 00

Location Desc: EPA 287 C#1

External Sample Number: _____

Expected Conc: (or Circle One: Low Medium High) **Date** **Time(24 hr)**

Latitude: ___ ___ ___ **Sample Collection: Start:** 8/25/06 10:28
Longitude: ___ ___ ___ **End:** __/__/__ __:__

Laboratory Analyses:

Container	Preservative	Holding Time	Analysis
1 - 8 oz glass	4 Deg C	180 Days	1 Metals in Solids by ICP

Sample Comments:
(N/A)

310 S. Buckeye

Sample Collected By: RC

Sample Collection Field Sheet
US EPA Region 7
Kansas City, KS

ASR Number: 3152 **Sample Number:** 11 **QC Code:** __ **Matrix:** Solid **Tag ID:** 3152-11-__

Project ID: EMA78Q00 **Project Manager:** Eddie McGlasson
Project Desc: United Zinc No. 1 site sampling
City: Iola **State:** Kansas
Program: Superfund
Site Name: United Zinc No. 1 - **Site ID:** A78Q **Site OU:** 00

Location Desc: EPA 281 C #1

External Sample Number: _____

Expected Conc: (or Circle One: Low Medium High) **Date** **Time(24 hr)**

Latitude: ___ ___ ___ **Sample Collection: Start:** 8/28/06 14:00
Longitude: ___ ___ ___ **End:** __/__/__ __:__

Laboratory Analyses:

Container	Preservative	Holding Time	Analysis
1 - 8 oz glass	4 Deg C	180 Days	1 Metals in Solids by ICP

Sample Comments:
(N/A)

401 S Buckeye

Sample Collected By: ~~RC~~ AH

Sample Collection Field Sheet
US EPA Region 7
Kansas City, KS

ASR Number: 3152 **Sample Number:** 12 **QC Code:** __ **Matrix:** Solid **Tag ID:** 3152-12-__

Project ID: EMA78Q00 **Project Manager:** Eddie McGlasson
Project Desc: United Zinc No. 1 site sampling
City: Iola **State:** Kansas
Program: Superfund
Site Name: United Zinc No. 1 - **Site ID:** A78Q **Site OU:** 00

Location Desc: EPA 328 C #4

External Sample Number: _____

Expected Conc: (or Circle One: Low Medium High) **Date** **Time(24 hr)**

Latitude: ___ ___ ___ **Sample Collection: Start:** 8/27/06 14:00
Longitude: ___ ___ ___ **End:** __/__/__ __:__

Laboratory Analyses:

Container	Preservative	Holding Time	Analysis
1 - 8 oz glass	4 Deg C	180 Days	1 Metals in Solids by ICP

Sample Comments:
(N/A)

102 N Buckeye

Sample Collected By: RC

Sample Collection Field Sheet
US EPA Region 7
Kansas City, KS

ASR Number: 3152 **Sample Number:** 13 **QC Code:** __ **Matrix:** Solid **Tag ID:** 3152-13-__

Project ID: EMA78Q00 **Project Manager:** Eddie McGlasson
Project Desc: United Zinc No. 1 site sampling
City: Iola **State:** Kansas
Program: Superfund
Site Name: United Zinc No. 1 - **Site ID:** A78Q **Site OU:** 00

Location Desc: EPA 334 C#1

External Sample Number: _____

Expected Conc: (or Circle One: Low Medium High) **Date** **Time(24 hr)**

Latitude: ___ ___ ___ **Sample Collection: Start:** 8/29/06 15:45
Longitude: ___ ___ ___ **End:** __/__/__ __:__

Laboratory Analyses:

Container	Preservative	Holding Time	Analysis
1 - 8 oz glass	4 Deg C	180 Days	1 Metals in Solids by ICP

Sample Comments:
(N/A)

210 S Cottonwood

Sample Collected By: ~~BC~~ AH

Sample Collection Field Sheet
US EPA Region 7
Kansas City, KS

ASR Number: 3152 **Sample Number:** 14 **QC Code:** __ **Matrix:** Solid **Tag ID:** 3152-14-__

Project ID: EMA78Q00 **Project Manager:** Eddie McGlasson
Project Desc: United Zinc No. 1 site sampling
City: Iola **State:** Kansas
Program: Superfund
Site Name: United Zinc No. 1 - **Site ID:** A78Q **Site OU:** 00

Location Desc: EPA 325 C #1

External Sample Number: _____

Expected Conc: (or Circle One: Low Medium High) **Date** **Time(24 hr)**

Latitude: ___ ___ ___ **Sample Collection: Start:** 8/30/06 10:45
Longitude: ___ ___ ___ **End:** __/__/__ __:__

Laboratory Analyses:

Container	Preservative	Holding Time	Analysis
1 - 8 oz glass	4 Deg C	180 Days	1 Metals In Solids by ICP

Sample Comments:
(N/A)

316 S. Cottonwood

Sample Collected By: RC

Sample Collection Field Sheet
US EPA Region 7
Kansas City, KS

ASR Number: 3152 **Sample Number:** 15 **QC Code:** __ **Matrix:** Solid **Tag ID:** 3152-15-__

Project ID: EMA78Q00 **Project Manager:** Eddie McGlasson
Project Desc: United Zinc No. 1 site sampling
City: Iola **State:** Kansas
Program: Superfund
Site Name: United Zinc No. 1 - **Site ID:** A78Q **Site OU:** 00

Location Desc: EPA 326 C#3

External Sample Number: _____

Expected Conc: (or Circle One: Low Medium High) **Date** **Time(24 hr)**

Latitude: ___ ___ ___ **Sample Collection: Start:** 8/30/06 11:30
Longitude: ___ ___ ___ **End:** __/__/__ __:__

Laboratory Analyses:

Container	Preservative	Holding Time	Analysis
1 - 8 oz glass	4 Deg C	180 Days	1 Metals in Solids by ICP

Sample Comments:
(N/A) 322 S. Coffonwood

Sample Collected By: RC

Sample Collection Field Sheet
US EPA Region 7
Kansas City, KS

ASR Number: 3152 **Sample Number:** 16 **QC Code:** __ **Matrix:** Solid **Tag ID:** 3152-16-__

Project ID: EMA78Q00 **Project Manager:** Eddie McGlasson
Project Desc: United Zinc No. 1 site sampling
City: Iola **State:** Kansas
Program: Superfund
Site Name: United Zinc No. 1 - **Site ID:** A78Q **Site OU:** 00

Location Desc: EPA 294 C#1

External Sample Number: _____

Expected Conc: (or Circle One: Low Medium High) **Date** **Time(24 hr)**

Latitude: ___ ___ ___ **Sample Collection: Start:** 8/30/06 13:45
Longitude: ___ ___ ___ **End:** __/__/__ __:__

Laboratory Analyses:

Container	Preservative	Holding Time	Analysis
1 - 8 oz glass	4 Deg C	180 Days	1 Metals in Solids by ICP

Sample Comments:
(N/A)

415 S. Coffeewood

Sample Collected By: RC

Sample Collection Field Sheet
US EPA Region 7
Kansas City, KS

ASR Number: 3152 **Sample Number:** 17 **QC Code:** __ **Matrix:** Solid **Tag ID:** 3152-17-__

Project ID: EMA78Q00 **Project Manager:** Eddie McGlasson
Project Desc: United Zinc No. 1 site sampling
City: Iola **State:** Kansas
Program: Superfund
Site Name: United Zinc No. 1 - **Site ID:** A78Q **Site OU:** 00

Location Desc: EPA 309 C #2

External Sample Number: _____

Expected Conc: (or Circle One: Low Medium High) **Date** **Time(24 hr)**

Latitude: __ __ __ **Sample Collection: Start:** 8/30/06 14:45
Longitude: __ __ __ **End:** __/__/__ __:__

Laboratory Analyses:

Container	Preservative	Holding Time	Analysis
1 - 8 oz glass	4 Deg C	180 Days	1 Metals in Solids by ICP

Sample Comments:
(N/A)

420 S. Cottonwood

Sample Collected By: RC

Sample Collection Field Sheet
US EPA Region 7
Kansas City, KS

ASR Number: 3152 **Sample Number:** 18 **QC Code:** __ **Matrix:** Solid **Tag ID:** 3152-18-__

Project ID: EMA78Q00 **Project Manager:** Eddie McGlasson
Project Desc: United Zinc No. 1 site sampling
City: Iola **State:** Kansas
Program: Superfund
Site Name: United Zinc No. 1 - **Site ID:** A78Q **Site OU:** 00

Location Desc: EPA 340 Cut

External Sample Number: _____

Expected Conc: (or Circle One: Low Medium High) **Date** **Time(24 hr)**

Latitude: ___ ___ ___ **Sample Collection: Start:** 8/30/06 17:15
Longitude: ___ ___ ___ **End:** __/__/__ __:__

Laboratory Analyses:

Container	Preservative	Holding Time	Analysis
1 - 8 oz glass	4 Deg C	180 Days	1 Metals In Solids by ICP

Sample Comments:
(N/A)

501 E. Madison

Sample Collected By: RC

Sample Collection Field Sheet
US EPA Region 7
Kansas City, KS

ASR Number: 3152 **Sample Number:** 19 **QC Code:** __ **Matrix:** Solid **Tag ID:** 3152-19-__

Project ID: EMA78Q00 **Project Manager:** Eddie McGlasson
Project Desc: United Zinc No. 1 site sampling
City: Iola **State:** Kansas
Program: Superfund
Site Name: United Zinc No. 1 - **Site ID:** A78Q **Site OU:** 00

Location Desc: EPA 314 C #3

External Sample Number: _____

Expected Conc: (or Circle One: Low Medium High) **Date** **Time(24 hr)**

Latitude: ___ ___ ___ **Sample Collection: Start:** 8/31/06 10:10
Longitude: ___ ___ ___ **End:** __/__/__ __:__

Laboratory Analyses:

Container	Preservative	Holding Time	Analysis
1 - 8 oz glass	4 Deg C	180 Days	1 Metals in Solids by ICP

Sample Comments:
(N/A)

502 S. Coffonwood

Sample Collected By: RC

Sample Collection Field Sheet
US EPA Region 7
Kansas City, KS

ASR Number: 3152 **Sample Number:** 20 **QC Code:** __ **Matrix:** Solid **Tag ID:** 3152-20-__

Project ID: EMA78Q00 **Project Manager:** Eddie McGlasson
Project Desc: United Zinc No. 1 site sampling
City: Iola **State:** Kansas
Program: Superfund
Site Name: United Zinc No. 1 - **Site ID:** A78Q **Site OU:** 00

Location Desc: EPA 315 C #1

External Sample Number: _____

Expected Conc: (or Circle One: Low Medium High) **Date** **Time(24 hr)**

Latitude: ___ ___ ___ **Sample Collection: Start:** 8/31/06 13:15
Longitude: ___ ___ ___ **End:** __/__/__ __:__

Laboratory Analyses:

Container	Preservative	Holding Time	Analysis
1 - 8 oz glass	4 Deg C	180 Days	1 Metals in Solids by ICP

Sample Comments:
(N/A)

622 S. Cottonwood

Sample Collected By: RC

CHAIN OF CUSTODY RECORD
ENVIRONMENTAL PROTECTION AGENCY REGION VII

ACTIVITY LEADER(Print)	NAME OF SURVEY OR ACTIVITY	DATE OF COLLECTION (DAY / MONTH / YEAR)	SHEET
Eddie McGlasson	United Zinc #1 Seasonal	6-15 / 09 / 06	1 of 1

CONTENTS OF SHIPMENT

SAMPLE NUMBER EMA78Q00	TYPE OF CONTAINERS: CUBITAINER	BOTTLE	BOTTLE	BOTTLE	VOA SET (2 VIALS EA)	SAMPLED MEDIA: water	soil	sediment	dust	other	RECEIVING LABORATORY REMARKS/OTHER INFORMATION (condition of samples upon receipt, other sample numbers, etc.)
	NUMBERS OF CONTAINERS PER SAMPLE NUMBER										
3153-1		1					X				
2		1					X				
3		1					X				
4		1					X				
5		1					X				
6		1					X				
7		1					X				
8		1					X				
9		1					X				
10		1					X				
11		1					X				
12		1					X				
13		1					X				
14		1					X				
15		1					X				
16		1					X				
17		1					X				
	Nothing More to Follow										

DESCRIPTION OF SHIPMENT

_____ PIECE(S) CONSISTING OF 1 BOX(ES)

_____ ICE CHEST(S): OTHER _____

MODE OF SHIPMENT

_____ COMMERCIAL CARRIER: _____

_____ COURIER

X SAMPLER CONVEYED

_____ (SHIPPING DOCUMENT NUMBER)

PERSONNEL CUSTODY RECORD

RELINQUISHED BY (SAMPLER)	DATE	TIME	RECEIVED BY	REASON FOR CHANGE OF CUSTODY
[signature] ☐ SEALED UNSEALED ☑	9/15/06	1700	☐ SEALED UNSEALED ☐	Delivery to Lab
RELINQUISHED BY ☐ SEALED UNSEALED ☐	DATE	TIME	RECEIVED BY ☐ SEALED UNSEALED ☐	REASON FOR CHANGE OF CUSTODY
RELINQUISHED BY ☐ SEALED UNSEALED ☐	DATE	TIME	RECEIVED BY ☐ SEALED UNSEALED ☐	REASON FOR CHANGE OF CUSTODY

7-EPA-9262(Revised 5/85)

*U.S. GPO: 2002-756-917/40053

Sample Collection Field Sheet
US EPA Region 7
Kansas City, KS

ASR Number: 3153 **Sample Number:** 1 **QC Code:** __ **Matrix:** Solid **Tag ID:** 3153-1-__

Project ID: EMA78Q00 **Project Manager:** Eddie McGlasson
Project Desc: United Zinc No. 1 site sampling
City: Iola **State:** Kansas
Program: Superfund
Site Name: United Zinc No. 1 - **Site ID:** A78Q **Site OU:** 00

Location Desc: EPA 373 C #1

External Sample Number: _____

Expected Conc: (or Circle One: Low Medium High) **Date** **Time(24 hr)**

Latitude: ___ ___ ___ **Sample Collection: Start:** 9/6/06 16:35
Longitude: ___ ___ ___ **End:** __/__/__ __:__

Laboratory Analyses:

Container	Preservative	Holding Time	Analysis
1 - 8 oz glass	4 Deg C	180 Days	1 Metals in Solids by ICP

Sample Comments:
(N/A)

622 N. Colborn

Sample Collected By: RC

Sample Collection Field Sheet
US EPA Region 7
Kansas City, KS

ASR Number: 3153 **Sample Number:** 2 **QC Code:** __ **Matrix:** Solid **Tag ID:** 3153-2-__

Project ID: EMA78Q00 **Project Manager:** Eddie McGlasson
Project Desc: United Zinc No. 1 site sampling
City: Iola **State:** Kansas
Program: Superfund
Site Name: United Zinc No. 1 - **Site ID:** A78Q **Site OU:** 00

Location Desc: EPA 364 C #2

External Sample Number: _____

Expected Conc: (or Circle One: Low Medium High) **Date** **Time(24 hr)**

Latitude: ___ ___ ___ **Sample Collection: Start:** 9/7/06 13:50
Longitude: ___ ___ ___ **End:** __/__/__ __:__

Laboratory Analyses:

Container	Preservative	Holding Time	Analysis
1 - 8 oz glass	4 Deg C	180 Days	1 Metals in Solids by ICP

Sample Comments:
(N/A)

218 S. Cottonwood

Sample Collected By: RC

Sample Collection Field Sheet
US EPA Region 7
Kansas City, KS

ASR Number: 3153 **Sample Number:** 3 **QC Code:** __ **Matrix:** Solid **Tag ID:** 3153-3-__

Project ID: EMA78Q00 **Project Manager:** Eddie McGlasson
Project Desc: United Zinc No. 1 site sampling
City: Iola **State:** Kansas
Program: Superfund
Site Name: United Zinc No. 1 - **Site ID:** A78Q **Site OU:** 00

Location Desc: EPA 330 C#2

External Sample Number: _____

Expected Conc: (or Circle One: Low Medium High) **Date** **Time(24 hr)**

Latitude: __ __ __ **Sample Collection: Start:** 9/8/06 11:20
Longitude: __ __ __ **End:** __/__/__ __:__

Laboratory Analyses:

Container	Preservative	Holding Time	Analysis
1 - 8 oz glass	4 Deg C	180 Days	1 Metals in Solids by ICP

Sample Comments:
(N/A)

512 S. Colborn

Sample Collected By: ~~BE~~ AH

Sample Collection Field Sheet
US EPA Region 7
Kansas City, KS

ASR Number: 3153 **Sample Number:** 4 **QC Code:** __ **Matrix:** Solid **Tag ID:** 3153-4-__

Project ID: EMA78Q00 **Project Manager:** Eddie McGlasson
Project Desc: United Zinc No. 1 site sampling
City: Iola **State:** Kansas
Program: Superfund
Site Name: United Zinc No. 1 - **Site ID:** A78Q **Site OU:** 00

Location Desc: EPA 392 C #1

External Sample Number: _____

Expected Conc: (or Circle One: Low Medium High) **Date** **Time(24 hr)**

Latitude: ___ ___ ___ **Sample Collection: Start:** 9/11/06 13:50
Longitude: ___ ___ ___ **End:** __/__/__ __:__

Laboratory Analyses:

Container	Preservative	Holding Time	Analysis
1 - 8 oz glass	4 Deg C	180 Days	1 Metals in Solids by ICP

Sample Comments:
(N/A)

520 S. Colbora

Sample Collected By: RC

Sample Collection Field Sheet
US EPA Region 7
Kansas City, KS

ASR Number: 3153 **Sample Number:** 5 **QC Code:** __ **Matrix:** Solid **Tag ID:** 3153-5-__

Project ID: EMA78Q00 **Project Manager:** Eddie McGlasson
Project Desc: United Zinc No. 1 site sampling
City: Iola **State:** Kansas
Program: Superfund
Site Name: United Zinc No. 1 - **Site ID:** A78Q **Site OU:** 00

Location Desc: EPA 333 C St

External Sample Number: _____

Expected Conc: (or Circle One: Low Medium High) **Date** **Time(24 hr)**

Latitude: ___ ___ ___ **Sample Collection: Start:** 9/11/06 0920
Longitude: ___ ___ ___ **End:** __/__/__ __:__

Laboratory Analyses:

Container	Preservative	Holding Time	Analysis
1 - 8 oz glass	4 Deg C	180 Days	1 Metals in Solids by ICP

Sample Comments:
(N/A)

423 S. Colbora.

Sample Collected By: RC

Sample Collection Field Sheet
US EPA Region 7
Kansas City, KS

ASR Number: 3153 **Sample Number:** 6 **QC Code:** __ **Matrix:** Solid **Tag ID:** 3153-6-__

Project ID: EMA78Q00 **Project Manager:** Eddie McGlasson
Project Desc: United Zinc No. 1 site sampling
City: Iola **State:** Kansas
Program: Superfund
Site Name: United Zinc No. 1 - **Site ID:** A78Q **Site OU:** 00

Location Desc: EPA 274 C #2

External Sample Number: _____

Expected Conc: (or Circle One: Low Medium High) **Date** **Time(24 hr)**

Latitude: ___ ___ ___ **Sample Collection: Start:** 9/11/06 16:50
Longitude: ___ ___ ___ **End:** __/__/__ __:__

Laboratory Analyses:

Container	Preservative	Holding Time	Analysis
1 - 8 oz glass	4 Deg C	180 Days	1 Metals in Solids by ICP

Sample Comments:
(N/A)

623 S. Sycamore

Sample Collected By: ~~BC~~ AK

Sample Collection Field Sheet
US EPA Region 7
Kansas City, KS

ASR Number: 3153 **Sample Number:** 7 **QC Code:** __ **Matrix:** Solid **Tag ID:** 3153-7-__

Project ID: EMA78Q00 **Project Manager:** Eddie McGlasson
Project Desc: United Zinc No. 1 site sampling
City: Iola **State:** Kansas
Program: Superfund
Site Name: United Zinc No. 1 - **Site ID:** A78Q **Site OU:** 00

Location Desc: EDA 344 C #2

External Sample Number: _____

Expected Conc: (or Circle One: Low Medium High) **Date** **Time(24 hr)**

Latitude: ___ ___ ___ **Sample Collection: Start:** 9/12/06 07:20
Longitude: ___ ___ ___ **End:** __/__/__ __:__

Laboratory Analyses:

Container	Preservative	Holding Time	Analysis
1 - 8 oz glass	4 Deg C	180 Days	1 Metals in Solids by ICP

Sample Comments:
(N/A) 216 S. Colborn

Sample Collected By: RC

Sample Collection Field Sheet
US EPA Region 7
Kansas City, KS

ASR Number: 3153 **Sample Number:** 8 **QC Code:** __ **Matrix:** Solid **Tag ID:** 3153-8-__

Project ID: EMA78Q00 **Project Manager:** Eddie McGlasson
Project Desc: United Zinc No. 1 site sampling
City: Iola **State:** Kansas
Program: Superfund
Site Name: United Zinc No. 1 - **Site ID:** A78Q **Site OU:** 00

Location Desc: EA 346 C #2

External Sample Number: _____

Expected Conc: (or Circle One: Low Medium High) **Date** **Time(24 hr)**

Latitude: ___ ___ ___ **Sample Collection: Start:** 9/12/06 11:15
Longitude: ___ ___ ___ **End:** __/__/__ __:__

Laboratory Analyses:

Container	Preservative	Holding Time	Analysis
1 - 8 oz glass	4 Deg C	180 Days	1 Metals in Solids by ICP

Sample Comments:
(N/A)

214 S. Colborn

Sample Collected By: ~~RC~~ AH

Sample Collection Field Sheet
US EPA Region 7
Kansas City, KS

ASR Number: 3153 **Sample Number:** 9 **QC Code:** __ **Matrix:** Solid **Tag ID:** 3153-9-__

Project ID: EMA78Q00 **Project Manager:** Eddie McGlasson
Project Desc: United Zinc No. 1 site sampling
City: Iola **State:** Kansas
Program: Superfund
Site Name: United Zinc No. 1 - **Site ID:** A78Q **Site OU:** 00

Location Desc: EPA 389 C #3

External Sample Number: _____

Expected Conc: (or Circle One: Low Medium High) **Date** **Time(24 hr)**

Latitude: __ __ __ **Sample Collection: Start:** 9/12/06 13:45
Longitude: __ __ __ **End:** __/__/__ __:__

Laboratory Analyses:

Container	Preservative	Holding Time	Analysis
1 - 8 oz glass	4 Deg C	180 Days	1 Metals in Solids by ICP

Sample Comments:
(N/A) 321 S. 2nd

Sample Collected By: ~~RC~~ AH

Sample Collection Field Sheet
US EPA Region 7
Kansas City, KS

ASR Number: 3153 **Sample Number:** 10 **QC Code:** __ **Matrix:** Solid **Tag ID:** 3153-10-__

Project ID: EMA78Q00 **Project Manager:** Eddie McGlasson
Project Desc: United Zinc No. 1 site sampling
City: Iola **State:** Kansas
Program: Superfund
Site Name: United Zinc No. 1 - **Site ID:** A78Q **Site OU:** 00

Location Desc: EPA 356 C #1

External Sample Number: _____

Expected Conc: (or Circle One: Low Medium High) **Date** **Time(24 hr)**

Latitude: ___ ___ ___ **Sample Collection: Start:** 9/12/06 15:45
Longitude: ___ ___ ___ **End:** __/__/__ __:__

Laboratory Analyses:

Container	Preservative	Holding Time	Analysis
1 - 8 oz glass	4 Deg C	180 Days	1 Metals in Solids by ICP

Sample Comments:
(N/A)

309 6 4th

Sample Collected By: RC

Sample Collection Field Sheet
US EPA Region 7
Kansas City, KS

ASR Number: 3153 **Sample Number:** 11 **QC Code:** __ **Matrix:** Solid **Tag ID:** 3153-11-__

Project ID: EMA78Q00 **Project Manager:** Eddie McGlasson
Project Desc: United Zinc No. 1 site sampling
City: Iola **State:** Kansas
Program: Superfund
Site Name: United Zinc No. 1 - **Site ID:** A78Q **Site OU:** 00

Location Desc: EPA 255 C#1

External Sample Number: _____

Expected Conc: (or Circle One: Low Medium High) **Date** **Time(24 hr)**

Latitude: __ __ __ **Sample Collection: Start:** 9/12/06 16:25
Longitude: __ __ __ **End:** __/__/__ __:__

Laboratory Analyses:

Container	Preservative	Holding Time	Analysis
1 - 8 oz glass	4 Deg C	180 Days	1 Metals in Solids by ICP

Sample Comments:
(N/A)

307 N Sycamore

Post. Exc.

Sample Collected By: ~~RC~~ AH

Sample Collection Field Sheet
US EPA Region 7
Kansas City, KS

ASR Number: 3153 **Sample Number:** 12 **QC Code:** __ **Matrix:** Solid **Tag ID:** 3153-12-__

Project ID: EMA78Q00 **Project Manager:** Eddie McGlasson
Project Desc: United Zinc No. 1 site sampling
City: Iola **State:** Kansas
Program: Superfund
Site Name: United Zinc No. 1 - **Site ID:** A78Q **Site OU:** 00

Location Desc: EPA 354 C#1

External Sample Number: _____

Expected Conc: (or Circle One: Low Medium High) **Date** **Time(24 hr)**

Latitude: ___ ___ ___ **Sample Collection: Start:** 9/13/06 17:05
Longitude: ___ ___ ___ **End:** __/__/__ __:__

Laboratory Analyses:

Container	Preservative	Holding Time	Analysis
1 - 8 oz glass	4 Deg C	180 Days	1 Metals in Solids by ICP

Sample Comments:
(N/A)

301 N. Buckeye

Sample Collected By: ~~BC~~ AH

Sample Collection Field Sheet
US EPA Region 7
Kansas City, KS

ASR Number: 3153 **Sample Number:** 13 **QC Code:** __ **Matrix:** Solid **Tag ID:** 3153-13-__

Project ID: EMA78Q00 **Project Manager:** Eddie McGlasson
Project Desc: United Zinc No. 1 site sampling
City: Iola **State:** Kansas
Program: Superfund
Site Name: United Zinc No. 1 - **Site ID:** A78Q **Site OU:** 00

Location Desc: EPA41 C # 3

External Sample Number: _____

Expected Conc: (or Circle One: Low Medium High) **Date** **Time(24 hr)**

Latitude: ___ ___ ___ **Sample Collection: Start:** 9/19/06 08:10
Longitude: ___ ___ ___ **End:** __/__/__ __:__

Laboratory Analyses:

Container	Preservative	Holding Time	Analysis
1 - 8 oz glass	4 Deg C	180 Days	1 Metals in Solids by ICP

Sample Comments:
(N/A) 405 South

Sample Collected By: RC

Sample Collection Field Sheet
US EPA Region 7
Kansas City, KS

ASR Number: 3153 **Sample Number:** 14 **QC Code:** __ **Matrix:** Solid **Tag ID:** 3153-14-__

Project ID: EMA78Q00 **Project Manager:** Eddie McGlasson
Project Desc: United Zinc No. 1 site sampling
City: Iola **State:** Kansas
Program: Superfund
Site Name: United Zinc No. 1 - **Site ID:** A78Q **Site OU:** 00

Location Desc: EPA 399 C#1

External Sample Number: _____

Expected Conc: (or Circle One: Low Medium High) **Date** **Time(24 hr)**

Latitude: ___ ___ ___ **Sample Collection: Start:** 9/14/06 10:35
Longitude: ___ ___ ___ **End:** __/__/__ __:__

Laboratory Analyses:

Container	Preservative	Holding Time	Analysis
1 - 8 oz glass	4 Deg C	180 Days	1 Metals in Solids by ICP

Sample Comments:
(N/A) 510 South St.

Sample Collected By: RC

Sample Collection Field Sheet
US EPA Region 7
Kansas City, KS

ASR Number: 3153 **Sample Number:** 15 **QC Code:** __ **Matrix:** Solid **Tag ID:** 3153-15-__

Project ID: EMA78Q00 **Project Manager:** Eddie McGlasson
Project Desc: United Zinc No. 1 site sampling
City: Iola **State:** Kansas
Program: Superfund
Site Name: United Zinc No. 1 - **Site ID:** A78Q **Site OU:** 00

Location Desc: EPA 337 C#1

External Sample Number: _____

Expected Conc: (or Circle One: Low Medium High) **Date** **Time(24 hr)**

Latitude: ___ ___ ___ **Sample Collection: Start:** 9/14/06 11:15

Longitude: ___ ___ ___ **End:** __/__/__ __:__

Laboratory Analyses:

Container	Preservative	Holding Time	Analysis
1 - 8 oz glass	4 Deg C	180 Days	1 Metals in Solids by ICP

Sample Comments:
(N/A)

822 South St.

Sample Collected By: RC

Sample Collection Field Sheet
US EPA Region 7
Kansas City, KS

ASR Number: 3153 **Sample Number:** 16 **QC Code:** __ **Matrix:** Solid **Tag ID:** 3153-16-__

Project ID: EMA78Q00 **Project Manager:** Eddie McGlasson
Project Desc: United Zinc No. 1 site sampling
City: Iola **State:** Kansas
Program: Superfund
Site Name: United Zinc No. 1 - **Site ID:** A78Q **Site OU:** 00

Location Desc: EPA 378 C #2

External Sample Number: _____

Expected Conc: (or Circle One: Low Medium High) **Date** **Time(24 hr)**

Latitude: ___ ___ ___ **Sample Collection: Start:** 9/15/06 11:20
Longitude: ___ ___ ___ **End:** __/__/__ __:__

Laboratory Analyses:

Container	Preservative	Holding Time	Analysis
1 - 8 oz glass	4 Deg C	180 Days	1 Metals in Solids by ICP

Sample Comments:
(N/A)

716 S. Chestnut

Sample Collected By: ~~BC~~ AH

Sample Collection Field Sheet
US EPA Region 7
Kansas City, KS

ASR Number: 3153 **Sample Number:** 17 **QC Code:** __ **Matrix:** Solid **Tag ID:** 3153-17-__

Project ID: EMA78Q00 **Project Manager:** Eddie McGlasson
Project Desc: United Zinc No. 1 site sampling
City: Iola **State:** Kansas
Program: Superfund
Site Name: United Zinc No. 1 - **Site ID:** A78Q **Site OU:** 00

Location Desc: EPA 391 C#1

External Sample Number: _____

Expected Conc: (or Circle One: Low Medium High) **Date** **Time(24 hr)**

Latitude: ___ ___ ___ **Sample Collection: Start:** 9/15/06 12:45
Longitude: ___ ___ ___ **End:** __/__/__ __:__

Laboratory Analyses:

Container	Preservative	Holding Time	Analysis
1 - 8 oz glass	4 Deg C	180 Days	1 Metals in Solids by ICP

Sample Comments:
(N/A)

715 S. Washington

Sample Collected By: ~~BC~~ AH

CHAIN OF CUSTODY RECORD
ENVIRONMENTAL PROTECTION AGENCY REGION VII

ACTIVITY LEADER(Print)	NAME OF SURVEY OR ACTIVITY	DATE OF COLLECTION (DAY / MONTH / YEAR)	SHEET
Eddie McGlasson	United Zinc #1 Removal	09 / 06	1 of 2

CONTENTS OF SHIPMENT

SAMPLE NUMBER	TYPE OF CONTAINERS: CUBITAINER	8 oz BOTTLE	BOTTLE	BOTTLE	VOA SET (2 VIALS EA)	SAMPLED MEDIA: water	soil	sediment	dust	other	RECEIVING LABORATORY REMARKS/OTHER INFORMATION (condition of samples upon receipt, other sample numbers, etc.)
	NUMBERS OF CONTAINERS PER SAMPLE NUMBER										
3154-1		1					X				
-2		1					X				
-3		1					X				
-4		1					X				
-5		1					X				
-6		1					X				
-7		1					X				
-8		1					X				
-9		1					X				
-10		1					X				
-11		1					X				
-12		1					X				
-13		1					X				
-14		1					X				
-15		1					X				
-16		1					X				
-17		1					X				
-18		1					X				
-19		1					X				
-20		1					X				
-21		1					X				
-22		1					X				
-23		1					X				
3154-24		1					X				

DESCRIPTION OF SHIPMENT

30 PIECE(S) CONSISTING OF X BOX(ES)

1 ICE CHEST(S): OTHER _____

MODE OF SHIPMENT

___ COMMERCIAL CARRIER: _____

___ COURIER

✓ SAMPLER CONVEYED

(SHIPPING DOCUMENT NUMBER)

PERSONNEL CUSTODY RECORD

9/29/06

RELINQUISHED BY (SAMPLER)	DATE	TIME	RECEIVED BY	REASON FOR CHANGE OF CUSTODY
[signature] ☐ SEALED ☐ UNSEALED	9/29/06	2:08	[signature] ☐ SEALED ☐ UNSEALED	Analysis
RELINQUISHED BY ☐ SEALED ☐ UNSEALED	DATE	TIME	RECEIVED BY ☐ SEALED ☐ UNSEALED	REASON FOR CHANGE OF CUSTODY
RELINQUISHED BY ☐ SEALED ☐ UNSEALED	DATE	TIME	RECEIVED BY ☐ SEALED ☐ UNSEALED	REASON FOR CHANGE OF CUSTODY

7-EPA-9262(Revised 5/85)

*U.S. GPO: 2002-756-917/40053

CHAIN OF CUSTODY RECORD
ENVIRONMENTAL PROTECTION AGENCY REGION VII

ACTIVITY LEADER(Print)	NAME OF SURVEY OR ACTIVITY	DATE OF COLLECTION (DAY / MONTH / YEAR)	SHEET
Eddie McGlassen	United Zinc #1 Removal	29 / 06	2 of 2

CONTENTS OF SHIPMENT

SAMPLE NUMBER	TYPE OF CONTAINERS: CUBITAINER	500 BOTTLE	BOTTLE	BOTTLE	VOA SET (2 VIALS EA)	SAMPLED MEDIA: water	soil	sediment	dust	other	RECEIVING LABORATORY REMARKS/OTHER INFORMATION (condition of samples upon receipt, other sample numbers, etc.)
	NUMBERS OF CONTAINERS PER SAMPLE NUMBER										
3154-25		1					X				
-26		1					X				
-27		1					X				
-28		1					X				
-29		1					X				
-30		1					X				
-31		1					X				
-32		1					X				
-33		1					X				
-34		1					X				
-35		1					X				
											Clr. Temp Recd. bet. 2-3°C

COC Back Complete Signature

DESCRIPTION OF SHIPMENT

35 PIECE(S) CONSISTING OF _____ BOX(ES)

1 ICE CHEST(S): OTHER _____

MODE OF SHIPMENT

____ COMMERCIAL CARRIER: _____

____ COURIER

✓ SAMPLER CONVEYED

(SHIPPING DOCUMENT NUMBER)

PERSONNEL CUSTODY RECORD

9/28&29/06

RELINQUISHED BY (SAMPLER)	DATE	TIME	RECEIVED BY	REASON FOR CHANGE OF CUSTODY
[signature] SEALED UNSEALED X	9/29/06	2:08	[signature] SEALED 1430 UNSEALED X	Analy
RELINQUISHED BY SEALED UNSEALED	DATE	TIME	RECEIVED BY SEALED UNSEALED	REASON FOR CHANGE OF CUSTODY
RELINQUISHED BY SEALED UNSEALED	DATE	TIME	RECEIVED BY SEALED UNSEALED	REASON FOR CHANGE OF CUSTODY

7-EPA-9262(Revised 5/85)

*U.S. GPO: 2002-756-917/40053

Sample Collection Field Sheet
US EPA Region 7
Kansas City, KS

ASR Number: 3154 **Sample Number:** 1 **QC Code:** __ **Matrix:** Solid **Tag ID:** 3154-1-__

Project ID: EMA78Q00 **Project Manager:** Eddie McGlasson
Project Desc: United Zinc No. 1 site sampling
City: Iola **State:** Kansas
Program: Superfund
Site Name: United Zinc No. 1 - **Site ID:** A78Q **Site OU:** 00

Location Desc: EPA 444 C #3

External Sample Number: _____

Expected Conc: (or Circle One: Low Medium High) **Date** **Time(24 hr)**

Latitude: __ __ __ **Sample Collection: Start:** 9/18/06 12:00
Longitude: __ __ __ **End:** __/__/__ __:__

Laboratory Analyses:

Container	Preservative	Holding Time	Analysis
1 - 8 oz glass	4 Deg C	180 Days	1 Metals in Solids by ICP

Sample Comments:
(N/A) 32.85 Ohio

Sample Collected By: RC

Sample Collection Field Sheet
US EPA Region 7
Kansas City, KS

ASR Number: 3154 **Sample Number:** 2 **QC Code:** __ **Matrix:** Solid **Tag ID:** 3154-2-__

Project ID: EMA78Q00 **Project Manager:** Eddie McGlasson
Project Desc: United Zinc No. 1 site sampling
City: Iola **State:** Kansas
Program: Superfund
Site Name: United Zinc No. 1 - **Site ID:** A78Q **Site OU:** 00

Location Desc: EPA 414 C#4

External Sample Number: _____

Expected Conc: (or Circle One: Low Medium High) **Date** **Time(24 hr)**

Latitude: ___ ___ ___ **Sample Collection: Start:** 9/18/06 16:50
Longitude: ___ ___ ___ **End:** __/__/__ __:__

Laboratory Analyses:

Container	Preservative	Holding Time	Analysis
1 - 8 oz glass	4 Deg C	180 Days	1 Metals in Solids by ICP

Sample Comments:
(N/A)

321 S. Elm

Sample Collected By: ~~BC~~ AH

Sample Collection Field Sheet
US EPA Region 7
Kansas City, KS

ASR Number: 3154 **Sample Number:** 3 **QC Code:** __ **Matrix:** Solid **Tag ID:** 3154-3-__

Project ID: EMA78Q00 **Project Manager:** Eddie McGlasson
Project Desc: United Zinc No. 1 site sampling
City: Iola **State:** Kansas
Program: Superfund
Site Name: United Zinc No. 1 - **Site ID:** A78Q **Site OU:** 00

Location Desc: EPA 408 C #3

External Sample Number: _____

Expected Conc: (or Circle One: Low Medium High)

			Date	Time(24 hr)
Latitude: 37.91910	**Sample Collection:**	**Start:**	9/19/06	11:80
Longitude: -95.39771		**End:**	__/__/__	__:__

Laboratory Analyses:

Container	Preservative	Holding Time	Analysis
1 - 8 oz glass	4 Deg C	180 Days	1 Metals in Solids by ICP

Sample Comments:
(N/A)

324 S. Oak

Sample Collected By: [illegible]

Sample Collection Field Sheet
US EPA Region 7
Kansas City, KS

ASR Number: 3154 **Sample Number:** 4 **QC Code:** __ **Matrix:** Solid **Tag ID:** 3154-4-__

Project ID: EMA78Q00 **Project Manager:** Eddie McGlasson
Project Desc: United Zinc No. 1 site sampling
City: Iola **State:** Kansas
Program: Superfund
Site Name: United Zinc No. 1 - **Site ID:** A78Q **Site OU:** 00

Location Desc: EPA 396 C #1

External Sample Number: _____

Expected Conc: (or Circle One: Low Medium High) **Date** **Time(24 hr)**

Latitude: ___ ___ ___ **Sample Collection: Start:** 9/19/06 15:45
Longitude: ___ ___ ___ **End:** __/__/__ __:__

Laboratory Analyses:

Container	Preservative	Holding Time	Analysis
1 - 8 oz glass	4 Deg C	180 Days	1 Metals in Solids by ICP

Sample Comments:
(N/A)

216 S.2 gd

Sample Collected By: RC

Sample Collection Field Sheet
US EPA Region 7
Kansas City, KS

ASR Number: 3154 **Sample Number:** 5 **QC Code:** __ **Matrix:** Solid **Tag ID:** 3154-5-__

Project ID: EMA78Q00 **Project Manager:** Eddie McGlasson
Project Desc: United Zinc No. 1 site sampling
City: Iola **State:** Kansas
Program: Superfund
Site Name: United Zinc No. 1 - **Site ID:** A78Q **Site OU:** 00

Location Desc: EPA #435 Cell-2

External Sample Number: _____

Expected Conc: (or Circle One: Low Medium High) **Date** **Time(24 hr)**

Latitude: ___ ___ ___ **Sample Collection: Start:** 9/21/06 15:15
Longitude: ___ ___ ___ **End:** __/__/__ __:__

Laboratory Analyses:

Container	Preservative	Holding Time	Analysis
1 - 8 oz glass	4 Deg C	180 Days	1 Metals in Solids by ICP

Sample Comments:
(N/A)

Sample Collected By: RC

Sample Collection Field Sheet
US EPA Region 7
Kansas City, KS

ASR Number: 3154 **Sample Number:** ~~5~~ 6 **QC Code:** __ **Matrix:** Solid **Tag ID:** 3154-~~5~~ 6-__

Project ID: EMA78Q00 **Project Manager:** Eddie McGlasson
Project Desc: United Zinc No. 1 site sampling
City: Iola **State:** Kansas
Program: Superfund
Site Name: United Zinc No. 1 - **Site ID:** A78Q **Site OU:** 00

Location Desc: EPA #558 C#2

External Sample Number: _____

Expected Conc: (or Circle One: Low Medium High) **Date** **Time(24 hr)**

Latitude: ___ ___ ___ **Sample Collection: Start:** 9/25/06 14:50
Longitude: ___ ___ ___ **End:** __/__/__ __:__

Laboratory Analyses:

Container	Preservative	Holding Time	Analysis
1 - 8 oz glass	4 Deg C	180 Days	1 Metals in Solids by ICP

Sample Comments:
(N/A)

524 S. 2nd

Sample Collected By: RC

Sample Collection Field Sheet
US EPA Region 7
Kansas City, KS

ASR Number: 3154 **Sample Number:** 7 **QC Code:** __ **Matrix:** Solid **Tag ID:** 3154-7-__

Project ID: EMA78Q00 **Project Manager:** Eddie McGlasson
Project Desc: United Zinc No. 1 site sampling
City: Iola **State:** Kansas
Program: Superfund
Site Name: United Zinc No. 1 - **Site ID:** A78Q **Site OU:** 00

Location Desc: EPA #65 C#2

External Sample Number: _____

Expected Conc: (or Circle One: Low Medium High) **Date** **Time(24 hr)**

Latitude: ___ ___ ___ **Sample Collection: Start:** 9/25/06 15:56
Longitude: ___ ___ ___ **End:** __/__/__ __:__

Laboratory Analyses:

Container	Preservative	Holding Time	Analysis
1 - 8 oz glass	4 Deg C	180 Days	1 Metals in Solids by ICP

Sample Comments:
(N/A)

201 N 1st

Sample Collected By: RC

Sample Collection Field Sheet
US EPA Region 7
Kansas City, KS

ASR Number: 3154 **Sample Number:** 8 **QC Code:** __ **Matrix:** Solid **Tag ID:** 3154-8-__

Project ID: EMA78Q00 **Project Manager:** Eddie McGlasson
Project Desc: United Zinc No. 1 site sampling
City: Iola **State:** Kansas
Program: Superfund
Site Name: United Zinc No. 1 - **Site ID:** A78Q **Site OU:** 00

Location Desc: EPA # 541 C#2

External Sample Number: _____

Expected Conc: (or Circle One: Low Medium High) **Date** **Time(24 hr)**

Latitude: ___ ___ ___ **Sample Collection: Start:** 9/25/06 11:40
Longitude: ___ ___ ___ **End:** __/__/__ __:__

Laboratory Analyses:

Container	Preservative	Holding Time	Analysis
1 - 8 oz glass	4 Deg C	180 Days	1 Metals in Solids by ICP

Sample Comments: 1624 E. Madison
(N/A)

Sample Collected By: KS

Sample Collection Field Sheet
US EPA Region 7
Kansas City, KS

ASR Number: 3154 **Sample Number:** 09 **QC Code:** __ **Matrix:** Solid **Tag ID:** 3154-9-__

Project ID: EMA78Q00 **Project Manager:** Eddie McGlasson
Project Desc: United Zinc No. 1 site sampling
City: Iola **State:** Kansas
Program: Superfund
Site Name: United Zinc No. 1 - **Site ID:** A78Q **Site OU:** 00

Location Desc: EPA 411 C#1

External Sample Number: _____

Expected Conc: (or Circle One: Low Medium High) **Date** **Time(24 hr)**

Latitude: ___ ___ ___ **Sample Collection: Start:** 9/27/06 09:50
Longitude: ___ ___ ___ **End:** __/__/__ __:__

Laboratory Analyses:

Container	Preservative	Holding Time	Analysis
1 - 8 oz glass	4 Deg C	180 Days	1 Metals in Solids by ICP

Sample Comments:
(N/A)

8 W Campbell

Sample Collected By: ~~RC~~ AH

Sample Collection Field Sheet
US EPA Region 7
Kansas City, KS

ASR Number: 3154 **Sample Number:** 10 **QC Code:** __ **Matrix:** Solid **Tag ID:** 3154-10-__

Project ID: EMA78Q00 **Project Manager:** Eddie McGlasson
Project Desc: United Zinc No. 1 site sampling
City: Iola **State:** Kansas
Program: Superfund
Site Name: United Zinc No. 1 - **Site ID:** A78Q **Site OU:** 00

Location Desc: EPA Site # 397 Cell #3

External Sample Number: _____

Expected Conc: (or Circle One: Low Medium High) **Date** **Time(24 hr)**

Latitude: ___ ___ ___ **Sample Collection: Start:** 9/16/06 16:15
Longitude: ___ ___ ___ **End:** __/__/__ __:__

Laboratory Analyses:

Container	Preservative	Holding Time	Analysis
1 - 8 oz glass	4 Deg C	180 Days	1 Metals in Solids by ICP

Sample Comments:
(N/A) 322 S. Washington

Sample Collected By: RC

Sample Collection Field Sheet
US EPA Region 7
Kansas City, KS

ASR Number: 3154 **Sample Number:** 11 **QC Code:** __ **Matrix:** Solid **Tag ID:** 3154-11-__

Project ID: EMA78Q00 **Project Manager:** Eddie McGlasson
Project Desc: United Zinc No. 1 site sampling
City: Iola **State:** Kansas
Program: Superfund
Site Name: United Zinc No. 1 - **Site ID:** A78Q **Site OU:** 00

Location Desc: EPA # 452 Cell # 5

External Sample Number: _____

Expected Conc: (or Circle One: Low Medium High) **Date** **Time(24 hr)**

Latitude: ___ ___ ___ **Sample Collection: Start:** 9/20/06 09:50
Longitude: ___ ___ ___ **End:** __/__/__ __:__

Laboratory Analyses:

Container	Preservative	Holding Time	Analysis
1 - 8 oz glass	4 Deg C	180 Days	1 Metals in Solids by ICP

Sample Comments:

(N/A) 410 S. Chestnut

Sample Collected By: RC

Sample Collection Field Sheet
US EPA Region 7
Kansas City, KS

ASR Number: 3154 **Sample Number:** 12 **QC Code:** __ **Matrix:** Solid **Tag ID:** 3154-12-__

Project ID: EMA78Q00 **Project Manager:** Eddie McGlasson
Project Desc: United Zinc No. 1 site sampling
City: Iola **State:** Kansas
Program: Superfund
Site Name: United Zinc No. 1 - **Site ID:** A78Q **Site OU:** 00

Location Desc: EPA #467 Cell #4

External Sample Number: _____

Expected Conc: (or Circle One: Low Medium High) **Date** **Time(24 hr)**

Latitude: ___ ___ ___ **Sample Collection: Start:** 9/20/06 14:05
Longitude: ___ ___ ___ **End:** __/__/__ __:__

Laboratory Analyses:

Container	Preservative	Holding Time	Analysis
1 - 8 oz glass	4 Deg C	180 Days	1 Metals in Solids by ICP

Sample Comments:

(N/A) 411 S Chestnut

Sample Collected By: RC

Sample Collection Field Sheet
US EPA Region 7
Kansas City, KS

ASR Number: 3154 **Sample Number:** 13 **QC Code:** __ **Matrix:** Solid **Tag ID:** 3154-13-__

Project ID: EMA78Q00 **Project Manager:** Eddie McGlasson
Project Desc: United Zinc No. 1 site sampling
City: Iola **State:** Kansas
Program: Superfund
Site Name: United Zinc No. 1 - **Site ID:** A78Q **Site OU:** 00

Location Desc: EPA # 467 Cell #2

External Sample Number: _____

Expected Conc: (or Circle One: Low Medium High) **Date** **Time(24 hr)**

Latitude: __ __ __ **Sample Collection: Start:** 9/20/06 13:50
Longitude: __ __ __ **End:** __/__/__ __:__

Laboratory Analyses:

Container	Preservative	Holding Time	Analysis
1 - 8 oz glass	4 Deg C	180 Days	1 Metals in Solids by ICP

Sample Comments:

(N/A) 411 S. Chestnut

Sample Collected By: RC

Sample Collection Field Sheet
US EPA Region 7
Kansas City, KS

ASR Number: 3154 **Sample Number:** 14 **QC Code:** __ **Matrix:** Solid **Tag ID:** 3154-14-__

Project ID: EMA78Q00 **Project Manager:** Eddie McGlasson
Project Desc: United Zinc No. 1 site sampling
City: Iola **State:** Kansas
Program: Superfund
Site Name: United Zinc No. 1 - **Site ID:** A78Q **Site OU:** 00

Location Desc: EPA # 434 Cell-1

External Sample Number: _____

Expected Conc: (or Circle One: Low Medium High) **Date** **Time(24 hr)**

Latitude: ___ ___ ___ **Sample Collection: Start:** 9/21/06 10:42
Longitude: ___ ___ ___ **End:** __/__/__ __:__

Laboratory Analyses:

Container	Preservative	Holding Time	Analysis
1 - 8 oz glass	4 Deg C	180 Days	1 Metals in Solids by ICP

Sample Comments:
(N/A) 302 N. Chestnut

Sample Collected By: RC

Sample Collection Field Sheet
US EPA Region 7
Kansas City, KS

ASR Number: 3154 **Sample Number:** 15 **QC Code:** __ **Matrix:** Solid **Tag ID:** 3154-15-__

Project ID: EMA78Q00 **Project Manager:** Eddie McGlasson
Project Desc: United Zinc No. 1 site sampling
City: Iola **State:** Kansas
Program: Superfund
Site Name: United Zinc No. 1 - **Site ID:** A78Q **Site OU:** 00

Location Desc: EPA # 463 Cell-2

External Sample Number: _____

Expected Conc: (or Circle One: Low Medium High) **Date** **Time(24 hr)**

Latitude: ___ ___ ___ **Sample Collection: Start:** 9/21/06 11:05
Longitude: ___ ___ ___ **End:** __/__/__ __:__

Laboratory Analyses:

Container	Preservative	Holding Time	Analysis
1 - 8 oz glass	4 Deg C	180 Days	1 Metals in Solids by ICP

Sample Comments:
(N/A) 221 N. 4th

Sample Collected By: RC

Sample Collection Field Sheet
US EPA Region 7
Kansas City, KS

ASR Number: 3154 **Sample Number:** 16 **QC Code:** __ **Matrix:** Solid **Tag ID:** 3154-16-__

Project ID: EMA78Q00 **Project Manager:** Eddie McGlasson
Project Desc: United Zinc No. 1 site sampling
City: Iola **State:** Kansas
Program: Superfund
Site Name: United Zinc No. 1 - **Site ID:** A78Q **Site OU:** 00

Location Desc: EPA #404 Cell-1

External Sample Number: _____

Expected Conc: (or Circle One: Low Medium High) **Date** **Time(24 hr)**

Latitude: ___ ___ ___ **Sample Collection: Start:** 9/21/06 11:50
Longitude: ___ ___ ___ **End:** __/__/__ __:__

Laboratory Analyses:

Container	Preservative	Holding Time	Analysis
1 - 8 oz glass	4 Deg C	180 Days	1 Metals in Solids by ICP

Sample Comments:

(N/A) 316 N. 1st

Sample Collected By: RC

Sample Collection Field Sheet
US EPA Region 7
Kansas City, KS

ASR Number: 3154 **Sample Number:** 17 **QC Code:** __ **Matrix:** Solid **Tag ID:** 3154-17-__

Project ID: EMA78Q00 **Project Manager:** Eddie McGlasson
Project Desc: United Zinc No. 1 site sampling
City: Iola **State:** Kansas
Program: Superfund
Site Name: United Zinc No. 1 - **Site ID:** A78Q **Site OU:** 00

Location Desc: EPA # 433 Cell-1

External Sample Number: _____

Expected Conc: (or Circle One: Low Medium High) **Date** **Time(24 hr)**

Latitude: __ __ __ **Sample Collection: Start:** 9/21/06 14:00
Longitude: __ __ __ **End:** __/__/__ __:__

Laboratory Analyses:

Container	Preservative	Holding Time	Analysis
1 - 8 oz glass	4 Deg C	180 Days	1 Metals In Solids by ICP

Sample Comments:
(N/A)
501 South Cottonwood

Sample Collected By: RC

Sample Collection Field Sheet
US EPA Region 7
Kansas City, KS

ASR Number: 3154 **Sample Number:** 18 **QC Code:** __ **Matrix:** Solid **Tag ID:** 3154-18-__

Project ID: EMA78Q00 **Project Manager:** Eddie McGlasson
Project Desc: United Zinc No. 1 site sampling
City: Iola **State:** Kansas
Program: Superfund
Site Name: United Zinc No. 1 - **Site ID:** A78Q **Site OU:** 00

Location Desc: EPA # 406 Cell-1

External Sample Number: _____

Expected Conc: (or Circle One: Low Medium High) **Date** **Time(24 hr)**

Latitude: ___ ___ ___ **Sample Collection: Start:** 9/21/06 14:41
Longitude: ___ ___ ___ **End:** __/__/__ __:__

Laboratory Analyses:

Container	Preservative	Holding Time	Analysis
1 - 8 oz glass	4 Deg C	180 Days	1 Metals in Solids by ICP

Sample Comments:
(N/A)
427 N. Vermont

Sample Collected By: RC

Sample Collection Field Sheet
US EPA Region 7
Kansas City, KS

ASR Number: 3154 **Sample Number:** 19 **QC Code:** __ **Matrix:** Solid **Tag ID:** 3154-19-__

Project ID: EMA78Q00 **Project Manager:** Eddie McGlasson
Project Desc: United Zinc No. 1 site sampling
City: Iola **State:** Kansas
Program: Superfund
Site Name: United Zinc No. 1 - **Site ID:** A78Q **Site OU:** 00

Location Desc: EPA# 431 CELL 3

External Sample Number: _____

Expected Conc: (or Circle One: Low Medium High) **Date** **Time(24 hr)**

Latitude: ___ ___ ___ **Sample Collection: Start:** 9/25/06 14:58
Longitude: ___ ___ ___ **End:** __/__/__ __:__

Laboratory Analyses:

Container	Preservative	Holding Time	Analysis
1 - 8 oz glass	4 Deg C	180 Days	1 Metals in Solids by ICP

Sample Comments:
(N/A)

Sample Collected By: RC

Sample Collection Field Sheet
US EPA Region 7
Kansas City, KS

ASR Number: 3154 **Sample Number:** 20 **QC Code:** __ **Matrix:** Solid **Tag ID:** 3154-20-__

Project ID: EMA78Q00 **Project Manager:** Eddie McGlasson
Project Desc: United Zinc No. 1 site sampling
City: Iola **State:** Kansas
Program: Superfund
Site Name: United Zinc No. 1 - **Site ID:** A78Q **Site OU:** 00

Location Desc: EPA # 416 CELL 3

External Sample Number: _____

Expected Conc: (or Circle One: Low Medium High) **Date** **Time(24 hr)**

Latitude: ___ ___ ___ **Sample Collection: Start:** 9/25/06 16:26

Longitude: ___ ___ ___ **End:** __/__/__ __:__

Laboratory Analyses:

Container	Preservative	Holding Time	Analysis
1 - 8 oz glass	4 Deg C	180 Days	1 Metals in Solids by ICP

Sample Comments:

(N/A)

Sample Collected By: RC

Sample Collection Field Sheet
US EPA Region 7
Kansas City, KS

ASR Number: 3154 **Sample Number:** 21 **QC Code:** __ **Matrix:** Solid **Tag ID:** 3154-21-__

Project ID: EMA78Q00 **Project Manager:** Eddie McGlasson
Project Desc: United Zinc No. 1 site sampling
City: Iola **State:** Kansas
Program: Superfund
Site Name: United Zinc No. 1 - **Site ID:** A78Q **Site OU:** 00

Location Desc: EPA # 458 Cell #3

External Sample Number: _____

Expected Conc: (or Circle One: Low Medium High) **Date** **Time(24 hr)**

Latitude: ___ ___ ___ **Sample Collection: Start:** 9/26/06 08:55
Longitude: ___ ___ ___ **End:** __/__/__ __:__

Laboratory Analyses:

Container	Preservative	Holding Time	Analysis
1 - 8 oz glass	4 Deg C	180 Days	1 Metals in Solids by ICP

Sample Comments:
(N/A)

Sample Collected By: RC

Sample Collection Field Sheet
US EPA Region 7
Kansas City, KS

ASR Number: 3154 **Sample Number:** 22 **QC Code:** __ **Matrix:** Solid **Tag ID:** 3154-22-__

Project ID: EMA78Q00 **Project Manager:** Eddie McGlasson
Project Desc: United Zinc No. 1 site sampling
City: Iola **State:** Kansas
Program: Superfund
Site Name: United Zinc No. 1 - **Site ID:** A78Q **Site OU:** 00

Location Desc: EPA # 547 Cell 4

External Sample Number: _____

Expected Conc: (or Circle One: Low Medium High) **Date** **Time(24 hr)**

Latitude: ___ ___ ___ **Sample Collection: Start:** 9/26/06 09:08
Longitude: ___ ___ ___ **End:** __/__/__ __:__

Laboratory Analyses:

Container	Preservative	Holding Time	Analysis
1 - 8 oz glass	4 Deg C	180 Days	1 Metals in Solids by ICP

Sample Comments:
(N/A)

Sample Collected By: RC

Sample Collection Field Sheet
US EPA Region 7
Kansas City, KS

ASR Number: 3154 **Sample Number:** 23 **QC Code:** __ **Matrix:** Solid **Tag ID:** 3154-23-__

Project ID: EMA78Q00 **Project Manager:** Eddie McGlasson
Project Desc: United Zinc No. 1 site sampling
City: Iola **State:** Kansas
Program: Superfund
Site Name: United Zinc No. 1 - **Site ID:** A78Q **Site OU:** 00

Location Desc: EPA 387 Cell 3

External Sample Number: _____

Expected Conc: (or Circle One: Low Medium High) **Date** **Time(24 hr)**

Latitude: ___ ___ ___ **Sample Collection: Start:** 9/26/06 11:30
Longitude: ___ ___ ___ **End:** __/__/__ __:__

Laboratory Analyses:

Container	Preservative	Holding Time	Analysis
1 - 8 oz glass	4 Deg C	180 Days	1 Metals in Solids by ICP

Sample Comments:
(N/A)

Sample Collected By: RC

Sample Collection Field Sheet
US EPA Region 7
Kansas City, KS

ASR Number: 3154 **Sample Number:** 24 **QC Code:** __ **Matrix:** Solid **Tag ID:** 3154-24-__

Project ID: EMA78Q00 **Project Manager:** Eddie McGlasson
Project Desc: United Zinc No. 1 site sampling
City: Iola **State:** Kansas
Program: Superfund
Site Name: United Zinc No. 1 - **Site ID:** A78Q **Site OU:** 00

Location Desc: EPA 524 Cell 3

External Sample Number: _____

Expected Conc: (or Circle One: Low Medium High) **Date** **Time(24 hr)**

Latitude: ___ ___ ___ **Sample Collection: Start:** 9/26/06 14:30
Longitude: ___ ___ ___ **End:** __/__/__ __:__

Laboratory Analyses:

Container	Preservative	Holding Time	Analysis
1 - 8 oz glass	4 Deg C	180 Days	1 Metals In Solids by ICP

Sample Comments:
(N/A)

Sample Collected By: RC

Sample Collection Field Sheet
US EPA Region 7
Kansas City, KS

ASR Number: 3154 **Sample Number:** 25 **QC Code:** __ **Matrix:** Solid **Tag ID:** 3154-25-__

Project ID: EMA78Q00 **Project Manager:** Eddie McGlasson
Project Desc: United Zinc No. 1 site sampling
City: Iola **State:** Kansas
Program: Superfund
Site Name: United Zinc No. 1 - **Site ID:** A78Q **Site OU:** 00

Location Desc: EPA 565 Cell #1

External Sample Number: _____

Expected Conc: (or Circle One: Low Medium High) **Date** **Time(24 hr)**

Latitude: ___ ___ ___ **Sample Collection: Start:** 9/26/06 16:30
Longitude: ___ ___ ___ **End:** __/__/__ __:__

Laboratory Analyses:

Container	Preservative	Holding Time	Analysis
1 - 8 oz glass	4 Deg C	180 Days	1 Metals in Solids by ICP

Sample Comments:
(N/A)

Sample Collected By: RC

Sample Collection Field Sheet
US EPA Region 7
Kansas City, KS

ASR Number: 3154 **Sample Number:** 26 **QC Code:** __ **Matrix:** Solid **Tag ID:** 3154-26-__

Project ID: EMA78Q00 **Project Manager:** Eddie McGlasson
Project Desc: United Zinc No. 1 site sampling
City: Iola **State:** Kansas
Program: Superfund
Site Name: United Zinc No. 1 - **Site ID:** A78Q **Site OU:** 00

Location Desc: EPA 579 Cell 2

External Sample Number: _____

Expected Conc: (or Circle One: Low Medium High) **Date** **Time(24 hr)**

Latitude: ___ ___ ___ **Sample Collection: Start:** 9/27/06 9:00
Longitude: ___ ___ ___ **End:** __/__/__ __:__

Laboratory Analyses:

Container	Preservative	Holding Time	Analysis
1 - 8 oz glass	4 Deg C	180 Days	1 Metals In Solids by ICP

Sample Comments:
(N/A)

Sample Collected By: RC

Sample Collection Field Sheet
US EPA Region 7
Kansas City, KS

ASR Number: 3154 **Sample Number:** 27 **QC Code:** __ **Matrix:** Solid **Tag ID:** 3154-27-__

Project ID: EMA78Q00 **Project Manager:** Eddie McGlasson
Project Desc: United Zinc No. 1 site sampling
City: Iola **State:** Kansas
Program: Superfund
Site Name: United Zinc No. 1 - **Site ID:** A78Q **Site OU:** 00

Location Desc: EPA 579 Cell 4

External Sample Number: _____

Expected Conc: (or Circle One: Low Medium High) **Date** **Time(24 hr)**

Latitude: ___ ___ ___ **Sample Collection: Start:** 9/27/06 9:15
Longitude: ___ ___ ___ **End:** __/__/__ __:__

Laboratory Analyses:

Container	Preservative	Holding Time	Analysis
1 - 8 oz glass	4 Deg C	180 Days	1 Metals in Solids by ICP

Sample Comments:
(N/A)

Sample Collected By: RC

Sample Collection Field Sheet
US EPA Region 7
Kansas City, KS

ASR Number: 3154 **Sample Number:** 28 **QC Code:** __ **Matrix:** Solid **Tag ID:** 3154-28-__

Project ID: EMA78Q00 **Project Manager:** Eddie McGlasson
Project Desc: United Zinc No. 1 site sampling
City: Iola **State:** Kansas
Program: Superfund
Site Name: United Zinc No. 1 - **Site ID:** A78Q **Site OU:** 00

Location Desc: EPA # 567 Cell 5

External Sample Number: _____

Expected Conc: (or Circle One: Low Medium High) **Date** **Time(24 hr)**

Latitude: ___ ___ ___ **Sample Collection: Start:** 9/27/06 10:58
Longitude: ___ ___ ___ **End:** __/__/__ __:__

Laboratory Analyses:

Container	Preservative	Holding Time	Analysis
1 - 8 oz glass	4 Deg C	180 Days	1 Metals in Solids by ICP

Sample Comments:
(N/A)

Sample Collected By: RC

Sample Collection Field Sheet
US EPA Region 7
Kansas City, KS

ASR Number: 3154 **Sample Number:** 29 **QC Code:** __ **Matrix:** Solid **Tag ID:** 3154-29-__

Project ID: EMA78Q00 **Project Manager:** Eddie McGlasson
Project Desc: United Zinc No. 1 site sampling
City: Iola **State:** Kansas
Program: Superfund
Site Name: United Zinc No. 1 - **Site ID:** A78Q **Site OU:** 00

Location Desc: EPA 554 cell 3

External Sample Number: _____

Expected Conc: (or Circle One: Low Medium High) **Date** **Time(24 hr)**

Latitude: ___ ___ ___ **Sample Collection: Start:** 9/27/06 14:25
Longitude: ___ ___ ___ **End:** __/__/__ __:__

Laboratory Analyses:

Container	Preservative	Holding Time	Analysis
1 - 8 oz glass	4 Deg C	180 Days	1 Metals in Solids by ICP

Sample Comments:
(N/A)

Sample Collected By: RC

Sample Collection Field Sheet
US EPA Region 7
Kansas City, KS

ASR Number: 3154 **Sample Number:** 30 **QC Code:** __ **Matrix:** Solid **Tag ID:** 3154-30-__

Project ID: EMA78Q00 **Project Manager:** Eddie McGlasson
Project Desc: United Zinc No. 1 site sampling
City: Iola **State:** Kansas
Program: Superfund
Site Name: United Zinc No. 1 - **Site ID:** A78Q **Site OU:** 00

Location Desc: EPA #509 Cell 2

External Sample Number: _____

Expected Conc: (or Circle One: Low Medium High) **Date** **Time(24 hr)**

Latitude: ___ ___ ___ **Sample Collection: Start:** 9/28/06 08:49
Longitude: ___ ___ ___ **End:** __/__/__ __:__

Laboratory Analyses:

Container	Preservative	Holding Time	Analysis
1 - 8 oz glass	4 Deg C	180 Days	1 Metals in Solids by ICP

Sample Comments:

(N/A)

Sample Collected By: RC

Sample Collection Field Sheet
US EPA Region 7
Kansas City, KS

ASR Number: 3154 **Sample Number:** 31 **QC Code:** __ **Matrix:** Solid **Tag ID:** 3154-31-__

Project ID: EMA78Q00 **Project Manager:** Eddie McGlasson
Project Desc: United Zinc No. 1 site sampling
City: Iola **State:** Kansas
Program: Superfund
Site Name: United Zinc No. 1 - **Site ID:** A78Q **Site OU:** 00

Location Desc: EPA #568 Cell 3

External Sample Number: _____

Expected Conc: (or Circle One: Low Medium High) **Date** **Time(24 hr)**

Latitude: ___ ___ ___ **Sample Collection: Start:** 08/29/06 08:51
Longitude: ___ ___ ___ **End:** __/__/__ __:__

Laboratory Analyses:

Container	Preservative	Holding Time	Analysis
1 - 8 oz glass	4 Deg C	180 Days	1 Metals in Solids by ICP

Sample Comments:
(N/A)

Sample Collected By: RC

Sample Collection Field Sheet
US EPA Region 7
Kansas City, KS

ASR Number: 3154 **Sample Number:** 32 **QC Code:** __ **Matrix:** Solid **Tag ID:** 3154-32-__

Project ID: EMA78Q00 **Project Manager:** Eddie McGlasson
Project Desc: United Zinc No. 1 site sampling
City: Iola **State:** Kansas
Program: Superfund
Site Name: United Zinc No. 1 - **Site ID:** A78Q **Site OU:** 00

Location Desc: EPA # 593 Cell 2

External Sample Number: _____

Expected Conc: (or Circle One: Low Medium High) **Date** **Time(24 hr)**

Latitude: ___ ___ ___ **Sample Collection: Start:** 9/28/04 15:18

Longitude: ___ ___ ___ **End:** __/__/__ __:__

Laboratory Analyses:

Container	Preservative	Holding Time	Analysis
1 - 8 oz glass	4 Deg C	180 Days	1 Metals In Solids by ICP

Sample Comments:

(N/A)

Sample Collected By: RC

Sample Collection Field Sheet
US EPA Region 7
Kansas City, KS

ASR Number: 3154 **Sample Number:** 33 **QC Code:** __ **Matrix:** Solid **Tag ID:** 3154-33-__

Project ID: EMA78Q00 **Project Manager:** Eddie McGlasson
Project Desc: United Zinc No. 1 site sampling
City: Iola **State:** Kansas
Program: Superfund
Site Name: United Zinc No. 1 - **Site ID:** A78Q **Site OU:** 00

Location Desc: EPA 591 cell 2

External Sample Number: _____

Expected Conc: (or Circle One: Low Medium High) **Date** **Time(24 hr)**

Latitude: ___ ___ ___ **Sample Collection: Start:** 9/28/05 16:00
Longitude: ___ ___ ___ **End:** __/__/__ __:__

Laboratory Analyses:

Container	Preservative	Holding Time	Analysis
1 - 8 oz glass	4 Deg C	180 Days	1 Metals in Solids by ICP

Sample Comments:
(N/A)

Sample Collected By: RC

Sample Collection Field Sheet
US EPA Region 7
Kansas City, KS

ASR Number: 3154 **Sample Number:** 34 **QC Code:** __ **Matrix:** Solid **Tag ID:** 3154-34-__

Project ID: EMA78Q00 **Project Manager:** Eddie McGlasson
Project Desc: United Zinc No. 1 site sampling
City: Iola **State:** Kansas
Program: Superfund
Site Name: United Zinc No. 1 - **Site ID:** A78Q **Site OU:** 00

Location Desc: EPA # 468 Cell # 2

External Sample Number: _____

Expected Conc: (or Circle One: Low Medium High) **Date** **Time(24 hr)**

Latitude: ___ ___ ___ **Sample Collection: Start:** 9/28/06 15:20
Longitude: ___ ___ ___ **End:** __/__/__ __:__

Laboratory Analyses:

Container	Preservative	Holding Time	Analysis
1 - 8 oz glass	4 Deg C	180 Days	1 Metals in Solids by ICP

Sample Comments:
(N/A) 418 South St

Sample Collected By: ~~BC~~ AH

Sample Collection Field Sheet
US EPA Region 7
Kansas City, KS

ASR Number: 3154 **Sample Number:** 35 **QC Code:** __ **Matrix:** Solid **Tag ID:** 3154-35-__

Project ID: EMA78Q00 **Project Manager:** Eddie McGlasson
Project Desc: United Zinc No. 1 site sampling
City: Iola **State:** Kansas
Program: Superfund
Site Name: United Zinc No. 1 - **Site ID:** A78Q **Site OU:** 00

Location Desc: EPA 532 Cell 2

External Sample Number: _____

Expected Conc: (or Circle One: Low Medium High) **Date** **Time(24 hr)**

Latitude: ___ ___ ___ **Sample Collection: Start:** 9/29/04 09:56
Longitude: ___ ___ ___ **End:** __/__/__ __:__

Laboratory Analyses:

Container	Preservative	Holding Time	Analysis
1 - 8 oz glass	4 Deg C	180 Days	1 Metals In Solids by ICP

Sample Comments:
(N/A) 15 W. Buckeye

Sample Collected By: RC

CHAIN OF CUSTODY RECORD
ENVIRONMENTAL PROTECTION AGENCY REGION VII

ACTIVITY LEADER(Print)	NAME OF SURVEY OR ACTIVITY	DATE OF COLLECTION (DAY / MONTH / YEAR)	SHEET
Eddie Mc Glasson	United Zinc #1 Removal	2-13 10 06	1 of 2

CONTENTS OF SHIPMENT

SAMPLE NUMBER EMA78QU	TYPE OF CONTAINERS: CUBITAINER	8oz BOTTLE	BOTTLE	BOTTLE	VOA SET (2 VIALS EA)	SAMPLED MEDIA: water	soil	sediment	dust	other	RECEIVING LABORATORY REMARKS/OTHER INFORMATION (condition of samples upon receipt, other sample numbers, etc.)
	NUMBERS OF CONTAINERS PER SAMPLE NUMBER										
3155-1		1					X				
2		1					X				
3		1					X				
4		1					X				
5		1					X				
6		1					X				
7		1					X				
8		1					X				
9		1					X				
10		1					X				
11		1					X				
12		1					X				
13		1					X				
14		1					X				
15		1					X				
16		1					X				
17		1					X				
18		1					X				
19		1					X				
20		1					X				
21		1					X				
22		1					X				
23		1					X				
24		1					X				

DESCRIPTION OF SHIPMENT	MODE OF SHIPMENT
____ PIECE(S) CONSISTING OF ____ BOX(ES)	____ COMMERCIAL CARRIER: ____
1 ICE CHEST(S): OTHER ____	____ COURIER
	X SAMPLER CONVEYED (SHIPPING DOCUMENT NUMBER)

PERSONNEL CUSTODY RECORD

RELINQUISHED BY (SAMPLER)	DATE	TIME	RECEIVED BY	REASON FOR CHANGE OF CUSTODY
☐ SEALED UNSEALED ☐			☐ SEALED UNSEALED ☐	
RELINQUISHED BY	DATE	TIME	RECEIVED BY	REASON FOR CHANGE OF CUSTODY
☐ SEALED UNSEALED ☐			☐ SEALED UNSEALED ☐	
RELINQUISHED BY	DATE	TIME	RECEIVED BY	REASON FOR CHANGE OF CUSTODY
☐ SEALED UNSEALED ☐			☐ SEALED UNSEALED ☐	

7-EPA-9262(Revised 5/85)

*U.S. GPO: 2002-756-917/40053

CHAIN OF CUSTODY RECORD
ENVIRONMENTAL PROTECTION AGENCY REGION VII

ACTIVITY LEADER(Print)	NAME OF SURVEY OR ACTIVITY	DATE OF COLLECTION (DAY / MONTH / YEAR)	SHEET
Eddie McGlasson	Chaffee Zinc #1 Removal	11-13 / 10 / 06	2 of 2

CONTENTS OF SHIPMENT

SAMPLE NUMBER EMA78000	TYPE OF CONTAINERS: CUBITAINER	BOTTLE (8 oz)	BOTTLE	BOTTLE	VOA SET (2 VIALS EA)	SAMPLED MEDIA: water	soil	sediment	dust	other	RECEIVING LABORATORY REMARKS/OTHER INFORMATION (condition of samples upon receipt, other sample numbers, etc.)
	NUMBERS OF CONTAINERS PER SAMPLE NUMBER										
3155-25		1					X				
26		1					X				
27		1					X				
28		1					X				
29		1					X				
30		1					X				
31		1					X				
32		1					X				
33		1					X				

Nothing More to Follow

DESCRIPTION OF SHIPMENT

_____ PIECE(S) CONSISTING OF _____ BOX(ES)

1 ICE CHEST(S); OTHER _____

MODE OF SHIPMENT

_____ COMMERCIAL CARRIER: _____

_____ COURIER

X SAMPLER CONVEYED

(SHIPPING DOCUMENT NUMBER)

PERSONNEL CUSTODY RECORD

RELINQUISHED BY (SAMPLER)	DATE	TIME	RECEIVED BY	REASON FOR CHANGE OF CUSTODY
SEALED UNSEALED			SEALED UNSEALED	
RELINQUISHED BY	DATE	TIME	RECEIVED BY	REASON FOR CHANGE OF CUSTODY
SEALED UNSEALED			SEALED UNSEALED	
RELINQUISHED BY	DATE	TIME	RECEIVED BY	REASON FOR CHANGE OF CUSTODY
SEALED UNSEALED			SEALED UNSEALED	

7-EPA-9262(Revised 5/85)

*U.S. GPO: 2002-756-917/40053

Sample Collection Field Sheet
US EPA Region 7
Kansas City, KS

ASR Number: 3155 **Sample Number:** 1 **QC Code:** __ **Matrix:** Solid **Tag ID:** 3155-1-__

Project ID: EMA78Q00 **Project Manager:** Eddie McGlasson
Project Desc: United Zinc No. 1 site sampling
City: Iola **State:** Kansas
Program: Superfund
Site Name: United Zinc No. 1 **Site ID:** A78Q **Site OU:** 00

Location Desc: EPA #531 Cell #2

External Sample Number: _____

Expected Conc: (or Circle One: Low Medium High) **Date** **Time(24 hr)**

Latitude: __ __ __ **Sample Collection: Start:** 10/2/06 14:10
Longitude: __ __ __ **End:** __/__/__ __:__

Laboratory Analyses:

Container	Preservative	Holding Time	Analysis
1 - 8 oz glass	4 Deg C	180 Days	1 Metals in Solids by ICP

Sample Comments:
(N/A)

706 E. Jackson

Sample Collected By: RC

Sample Collection Field Sheet
US EPA Region 7
Kansas City, KS

ASR Number: 3155 **Sample Number:** 2 **QC Code:** __ **Matrix:** Solid **Tag ID:** 3155-2-__

Project ID: EMA78Q00 **Project Manager:** Eddie McGlasson
Project Desc: United Zinc No. 1 site sampling
City: Iola **State:** Kansas
Program: Superfund
Site Name: United Zinc No. 1 - **Site ID:** A78Q **Site OU:** 00

Location Desc: EPA# 505 Cell #2

External Sample Number: _____

Expected Conc: (or Circle One: Low Medium High) **Date** **Time(24 hr)**

Latitude: ___ ___ ___ **Sample Collection: Start:** 10/3/06 09:45
Longitude: ___ ___ ___ **End:** __/__/__ __:__

Laboratory Analyses:

Container	Preservative	Holding Time	Analysis
1 - 8 oz glass	4 Deg C	180 Days	1 Metals in Solids by ICP

Sample Comments: 416 E Lincoln
(N/A)

Sample Collected By: RC

Sample Collection Field Sheet
US EPA Region 7
Kansas City, KS

ASR Number: 3155 **Sample Number:** 3 **QC Code:** __ **Matrix:** Solid **Tag ID:** 3155-3-__

Project ID: EMA78Q00 **Project Manager:** Eddie McGlasson
Project Desc: United Zinc No. 1 site sampling
City: Iola **State:** Kansas
Program: Superfund
Site Name: United Zinc No. 1 - **Site ID:** A78Q **Site OU:** 00

Location Desc: EPA# 515 Cell # 1

External Sample Number: _____

Expected Conc: (or Circle One: Low Medium High) **Date** **Time(24 hr)**

Latitude: ___ ___ ___ **Sample Collection: Start:** 10/3/06 13:05
Longitude: ___ ___ ___ **End:** __/__/__ __:__

Laboratory Analyses:

Container	Preservative	Holding Time	Analysis
1 - 8 oz glass	4 Deg C	180 Days	1 Metals in Solids by ICP

Sample Comments:
(N/A) 618 E. Lincoln

Sample Collected By: RC

Sample Collection Field Sheet
US EPA Region 7
Kansas City, KS

ASR Number: 3155 **Sample Number:** 4 **QC Code:** __ **Matrix:** Solid **Tag ID:** 3155-4-__

Project ID: EMA78Q00 **Project Manager:** Eddie McGlasson
Project Desc: United Zinc No. 1 site sampling
City: Iola **State:** Kansas
Program: Superfund
Site Name: United Zinc No. 1 - **Site ID:** A78Q **Site OU:** 00

Location Desc: EPA # 514 Cell # 1

External Sample Number: _____

Expected Conc: (or Circle One: Low Medium High) **Date** **Time(24 hr)**

Latitude: ___ ___ ___ **Sample Collection: Start:** 10/3/06 14:06
Longitude: ___ ___ ___ **End:** __/__/__ __:__

Laboratory Analyses:

Container	Preservative	Holding Time	Analysis
1 - 8 oz glass	4 Deg C	180 Days	1 Metals in Solids by ICP

Sample Comments:
(N/A)

Cell E Lincoln

Sample Collected By: RC

Sample Collection Field Sheet
US EPA Region 7
Kansas City, KS

ASR Number: 3155 **Sample Number:** 5 **QC Code:** __ **Matrix:** Solid **Tag ID:** 3155-5-__

Project ID: EMA78Q00 **Project Manager:** Eddie McGlasson
Project Desc: United Zinc No. 1 site sampling
City: Iola **State:** Kansas
Program: Superfund
Site Name: United Zinc No. 1 - **Site ID:** A78Q **Site OU:** 00

Location Desc: EPA#625 Cell #1

External Sample Number: _____

Expected Conc: (or Circle One: Low Medium High) **Date** **Time(24 hr)**

Latitude: ___ ___ ___ **Sample Collection: Start:** 10/4/06 12:35
Longitude: ___ ___ ___ **End:** __/__/__ __:__

Laboratory Analyses:

Container	Preservative	Holding Time	Analysis
1 - 8 oz glass	4 Deg C	180 Days	1 Metals in Solids by ICP

Sample Comments:
(N/A)

202 S. Cottonwood

Sample Collected By: RC

Sample Collection Field Sheet
US EPA Region 7
Kansas City, KS

ASR Number: 3155 **Sample Number:** 6 **QC Code:** __ **Matrix:** Solid **Tag ID:** 3155-6-__

Project ID: EMA78Q00 **Project Manager:** Eddie McGlasson
Project Desc: United Zinc No. 1 site sampling
City: Iola **State:** Kansas
Program: Superfund
Site Name: United Zinc No. 1 - **Site ID:** A78Q **Site OU:** 00

Location Desc: EPA#239 Cell #3

External Sample Number: _____

Expected Conc: (or Circle One: Low Medium High) **Date** **Time(24 hr)**

Latitude: ___ ___ ___ **Sample Collection: Start:** 10/4/06 10:25
Longitude: ___ ___ ___ **End:** __/__/__ __:__

Laboratory Analyses:

Container	Preservative	Holding Time	Analysis
1 - 8 oz glass	4 Deg C	180 Days	1 Metals in Solids by ICP

Sample Comments:
(N/A)

5 E. Irwin

Sample Collected By: RC

Sample Collection Field Sheet
US EPA Region 7
Kansas City, KS

ASR Number: 3155 **Sample Number:** 7 **QC Code:** __ **Matrix:** Solid **Tag ID:** 3155-7-__

Project ID: EMA78Q00 **Project Manager:** Eddie McGlasson
Project Desc: United Zinc No. 1 site sampling
City: Iola **State:** Kansas
Program: Superfund
Site Name: United Zinc No. 1 - **Site ID:** A78Q **Site OU:** 00

Location Desc: EPA#486 Cell #2

External Sample Number: _____

Expected Conc: (or Circle One: Low Medium High) **Date** **Time(24 hr)**

Latitude: ___ ___ ___ **Sample Collection: Start:** 10/4/06 10:45
Longitude: ___ ___ ___ **End:** __/__/__ __:__

Laboratory Analyses:

Container	Preservative	Holding Time	Analysis
1 - 8 oz glass	4 Deg C	180 Days	1 Metals in Solids by ICP

Sample Comments:
(N/A)

704 E Carpenter

Sample Collected By: RC

Sample Collection Field Sheet
US EPA Region 7
Kansas City, KS

ASR Number: 3155 **Sample Number:** 8 **QC Code:** __ **Matrix:** Solid **Tag ID:** 3155-8-__

Project ID: EMA78Q00 **Project Manager:** Eddie McGlasson
Project Desc: United Zinc No. 1 site sampling
City: Iola **State:** Kansas
Program: Superfund
Site Name: United Zinc No. 1 - **Site ID:** A78Q **Site OU:** 00

Location Desc: EPA #610 Cell #1

External Sample Number: _____

Expected Conc: (or Circle One: Low Medium High) **Date** **Time(24 hr)**

Latitude: ___ ___ ___ **Sample Collection: Start:** 10/4/06 12:40
Longitude: ___ ___ ___ **End:** __/__/__ __:__

Laboratory Analyses:

Container	Preservative	Holding Time	Analysis
1 - 8 oz glass	4 Deg C	180 Days	1 Metals in Solids by ICP

Sample Comments:
(N/A) 310 S. 4th

Sample Collected By: RC

Sample Collection Field Sheet
US EPA Region 7
Kansas City, KS

ASR Number: 3155 **Sample Number:** 9 **QC Code:** __ **Matrix:** Solid **Tag ID:** 3155-9-__

Project ID: EMA78Q00 **Project Manager:** Eddie McGlasson
Project Desc: United Zinc No. 1 site sampling
City: Iola **State:** Kansas
Program: Superfund
Site Name: United Zinc No. 1 - **Site ID:** A78Q **Site OU:** 00

Location Desc: EPA # 607 Cell #1

External Sample Number: _____

Expected Conc: (or Circle One: Low Medium High) **Date** **Time(24 hr)**

Latitude: __ __ __ **Sample Collection: Start:** 10/4/06 13:15
Longitude: __ __ __ **End:** __/__/__ __:__

Laboratory Analyses:

Container	Preservative	Holding Time	Analysis
1 - 8 oz glass	4 Deg C	180 Days	1 Metals in Solids by ICP

Sample Comments:
(N/A)

526 S. 4th

Sample Collected By: RC

Sample Collection Field Sheet
US EPA Region 7
Kansas City, KS

ASR Number: 3155 **Sample Number:** 10 **QC Code:** __ **Matrix:** Solid **Tag ID:** 3155-10-__

Project ID: EMA78Q00 **Project Manager:** Eddie McGlasson
Project Desc: United Zinc No. 1 site sampling
City: Iola **State:** Kansas
Program: Superfund
Site Name: United Zinc No. 1 - **Site ID:** A78Q **Site OU:** 00

Location Desc: EPA # 659 Cell-1

External Sample Number: _____

Expected Conc: (or Circle One: Low Medium High) **Date** **Time(24 hr)**

Latitude: ___ ___ ___ **Sample Collection: Start:** 10/5/06 16:30
Longitude: ___ ___ ___ **End:** __/__/__ __:__

Laboratory Analyses:

Container	Preservative	Holding Time	Analysis
1 - 8 oz glass	4 Deg C	180 Days	1 Metals in Solids by ICP

Sample Comments:
(N/A)

22 S. Ohio St.

Sample Collected By: RC

Sample Collection Field Sheet
US EPA Region 7
Kansas City, KS

ASR Number: 3155 **Sample Number:** 11 **QC Code:** __ **Matrix:** Solid **Tag ID:** 3155-11-__

Project ID: EMA78Q00 **Project Manager:** Eddie McGlasson
Project Desc: United Zinc No. 1 site sampling
City: Iola **State:** Kansas
Program: Superfund
Site Name: United Zinc No. 1 - **Site ID:** A78Q **Site OU:** 00

Location Desc: EPA # 234 Cell 2

External Sample Number: _____

Expected Conc: (or Circle One: Low Medium High) **Date** **Time(24 hr)**

Latitude: ___ ___ ___ **Sample Collection: Start:** 10/05/06 14:56
Longitude: ___ ___ ___ **End:** __/__/__ __:__

Laboratory Analyses:

Container	Preservative	Holding Time	Analysis
1 - 8 oz glass	4 Deg C	180 Days	1 Metals in Solids by ICP

Sample Comments:
(N/A)

S. E. Irwin St.

Sample Collected By: RC

Sample Collection Field Sheet
US EPA Region 7
Kansas City, KS

ASR Number: 3155 **Sample Number:** 12 **QC Code:** __ **Matrix:** Solid **Tag ID:** 3155-12-__

Project ID: EMA78Q00 **Project Manager:** Eddie McGlasson
Project Desc: United Zinc No. 1 site sampling
City: Iola **State:** Kansas
Program: Superfund
Site Name: United Zinc No. 1 - **Site ID:** A78Q **Site OU:** 00

Location Desc: EPA # 601 C

External Sample Number: _____

Expected Conc: (or Circle One: Low Medium High) **Date** **Time(24 hr)**

Latitude: ___ ___ ___ **Sample Collection: Start:** 10/05/06 09:00
Longitude: ___ ___ ___ **End:** __/__/__ __:__

Laboratory Analyses:

Container	Preservative	Holding Time	Analysis
1 - 8 oz glass	4 Deg C	180 Days	1 Metals in Solids by ICP

Sample Comments:
(N/A) 401 S. Chestnut

Sample Collected By: RC

Sample Collection Field Sheet
US EPA Region 7
Kansas City, KS

ASR Number: 3155 **Sample Number:** 13 **QC Code:** __ **Matrix:** Solid **Tag ID:** 3155-13-__

Project ID: EMA78Q00 **Project Manager:** Eddie McGlasson
Project Desc: United Zinc No. 1 site sampling
City: Iola **State:** Kansas
Program: Superfund
Site Name: United Zinc No. 1 - **Site ID:** A78Q **Site OU:** 00

Location Desc: EPA # 664 Cell-1

External Sample Number: _____

Expected Conc: (or Circle One: Low Medium High) **Date** **Time(24 hr)**

Latitude: ___ ___ ___ **Sample Collection: Start:** 10/05/06 13:15

Longitude: ___ ___ ___ **End:** __/__/__ __:__

Laboratory Analyses:

Container	Preservative	Holding Time	Analysis
1 - 8 oz glass	4 Deg C	180 Days	1 Metals in Solids by ICP

Sample Comments:

(N/A)

315 S. Washington

Sample Collected By: RC

Sample Collection Field Sheet
US EPA Region 7
Kansas City, KS

ASR Number: 3155 **Sample Number:** 14 **QC Code:** __ **Matrix:** Solid **Tag ID:** 3155-14-__

Project ID: EMA78Q00 **Project Manager:** Eddie McGlasson
Project Desc: United Zinc No. 1 site sampling
City: Iola **State:** Kansas
Program: Superfund
Site Name: United Zinc No. 1 - **Site ID:** A78Q **Site OU:** 00

Location Desc: EPA # 662 Cell-3

External Sample Number: _____

Expected Conc: (or Circle One: Low Medium High) **Date** **Time(24 hr)**

Latitude: ___ ___ ___ **Sample Collection: Start:** 10/05/06 16:30
Longitude: ___ ___ ___ **End:** __/__/__ __:__

Laboratory Analyses:

Container	Preservative	Holding Time	Analysis
1 - 8 oz glass	4 Deg C	180 Days	1 Metals in Solids by ICP

Sample Comments:
(N/A) 206 S. Kentucky

Sample Collected By: RC

Sample Collection Field Sheet
US EPA Region 7
Kansas City, KS

ASR Number: 3155 **Sample Number:** 15 **QC Code:** __ **Matrix:** Solid **Tag ID:** 3155-15-__

Project ID: EMA78Q00 **Project Manager:** Eddie McGlasson
Project Desc: United Zinc No. 1 site sampling
City: Iola **State:** Kansas
Program: Superfund
Site Name: United Zinc No. 1 - **Site ID:** A78Q **Site OU:** 00

Location Desc: EPA 621 Cell #1

External Sample Number: _____

Expected Conc: (or Circle One: Low Medium High) **Date** **Time(24 hr)**

Latitude: ___ ___ ___ **Sample Collection: Start:** 10/6/06 12:56
Longitude: ___ ___ ___ **End:** __/__/__ __:__

Laboratory Analyses:

Container	Preservative	Holding Time	Analysis
1 - 8 oz glass	4 Deg C	180 Days	1 Metals in Solids by ICP

Sample Comments:
(N/A) 617 E. Broadway

Sample Collected By: RC

Sample Collection Field Sheet
US EPA Region 7
Kansas City, KS

ASR Number: 3155 **Sample Number:** 16 **QC Code:** __ **Matrix:** Solid **Tag ID:** 3155-16-__

Project ID: EMA78Q00 **Project Manager:** Eddie McGlasson
Project Desc: United Zinc No. 1 site sampling
City: Iola **State:** Kansas
Program: Superfund
Site Name: United Zinc No. 1 - **Site ID:** A78Q **Site OU:** 00

Location Desc: EPA #553 Cell #6

External Sample Number: _____

Expected Conc: (or Circle One: Low Medium High) **Date** **Time(24 hr)**

Latitude: ___ ___ ___ **Sample Collection: Start:** 10/6/06 11:27
Longitude: ___ ___ ___ **End:** __/__/__ __:__

Laboratory Analyses:

Container	Preservative	Holding Time	Analysis
1 - 8 oz glass	4 Deg C	180 Days	1 Metals in Solids by ICP

Sample Comments:
(N/A)

519 E Madison

Sample Collected By: RC

Sample Collection Field Sheet
US EPA Region 7
Kansas City, KS

ASR Number: 3155 **Sample Number:** 17 **QC Code:** __ **Matrix:** Solid **Tag ID:** 3155-17-__

Project ID: EMA78Q00 **Project Manager:** Eddie McGlasson
Project Desc: United Zinc No. 1 site sampling
City: Iola **State:** Kansas
Program: Superfund
Site Name: United Zinc No. 1 - **Site ID:** A78Q **Site OU:** 00

Location Desc: EPA 658 C #1

External Sample Number: _____

Expected Conc: (or Circle One: Low Medium High) **Date** **Time(24 hr)**

Latitude: ___ ___ ___ **Sample Collection: Start:** 10/9/06 17:15
Longitude: ___ ___ ___ **End:** __/__/__ __:__

Laboratory Analyses:

Container	Preservative	Holding Time	Analysis
1 - 8 oz glass	4 Deg C	180 Days	1 Metals in Solids by ICP

Sample Comments:
(N/A)

611 N. Oak

Sample Collected By: ~~RC~~ AH

Sample Collection Field Sheet
US EPA Region 7
Kansas City, KS

ASR Number: 3155 **Sample Number:** 18 **QC Code:** __ **Matrix:** Solid **Tag ID:** 3155-18-__

Project ID: EMA78Q00 **Project Manager:** Eddie McGlasson
Project Desc: United Zinc No. 1 site sampling
City: Iola **State:** Kansas
Program: Superfund
Site Name: United Zinc No. 1 - **Site ID:** A78Q **Site OU:** 00

Location Desc: EPA# 720 Cell #1

External Sample Number: _____

Expected Conc: (or Circle One: Low Medium High)

Latitude: ___ ___ ___
Longitude: ___ ___ ___

	Date	Time(24 hr)
Sample Collection: Start:	10/10/06	11:20
End:	__/__/__	__:__

Laboratory Analyses:

Container	Preservative	Holding Time	Analysis
1 - 8 oz glass	4 Deg C	180 Days	1 Metals in Solids by ICP

Sample Comments:
(N/A)

Sample Collected By: ~~RC~~ KH

Sample Collection Field Sheet
US EPA Region 7
Kansas City, KS

ASR Number: 3155 **Sample Number:** 19 **QC Code:** __ **Matrix:** Solid **Tag ID:** 3155-19-__

Project ID: EMA78Q00 **Project Manager:** Eddie McGlasson
Project Desc: United Zinc No. 1 site sampling
City: Iola **State:** Kansas
Program: Superfund
Site Name: United Zinc No. 1 - **Site ID:** A78Q **Site OU:** 00

Location Desc: EPA # 710 Cell #5

External Sample Number: _____

Expected Conc: (or Circle One: Low Medium High) **Date** **Time(24 hr)**

Latitude: ___ ___ ___ **Sample Collection: Start:** 10/10/06 15:14

Longitude: ___ ___ ___ **End:** __/__/__ __:__

Laboratory Analyses:

Container	Preservative	Holding Time	Analysis
1 - 8 oz glass	4 Deg C	180 Days	1 Metals in Solids by ICP

Sample Comments:
(N/A)

402 S 4th

Sample Collected By: RC

Sample Collection Field Sheet
US EPA Region 7
Kansas City, KS

ASR Number: 3155 **Sample Number:** 20 **QC Code:** __ **Matrix:** Solid **Tag ID:** 3155-20-__

Project ID: EMA78Q00 **Project Manager:** Eddie McGlasson
Project Desc: United Zinc No. 1 site sampling
City: Iola **State:** Kansas
Program: Superfund
Site Name: United Zinc No. 1 - **Site ID:** A78Q **Site OU:** 00

Location Desc: EPA # 683, Cell 4

External Sample Number: _____

Expected Conc: (or Circle One: Low Medium High) **Date** **Time(24 hr)**

Latitude: ___ ___ ___ **Sample Collection: Start:** 10/11/06 10:30
Longitude: ___ ___ ___ **End:** __/__/__ __:__

Laboratory Analyses:

Container	Preservative	Holding Time	Analysis
1 - 8 oz glass	4 Deg C	180 Days	1 Metals in Solids by ICP

Sample Comments:

(N/A) 117 ppm

[redacted]

Sample Collected By: RC

Sample Collection Field Sheet
US EPA Region 7
Kansas City, KS

ASR Number: 3155 **Sample Number:** 21 **QC Code:** __ **Matrix:** Solid **Tag ID:** 3155-21-__

Project ID: EMA78Q00 **Project Manager:** Eddie McGlasson
Project Desc: United Zinc No. 1 site sampling
City: Iola **State:** Kansas
Program: Superfund
Site Name: United Zinc No. 1 - **Site ID:** A78Q **Site OU:** 00

Location Desc: EPA # 685, Cell 3

External Sample Number: _____

Expected Conc: (or Circle One: Low Medium High) **Date** **Time(24 hr)**

Latitude: ___ ___ ___ **Sample Collection: Start:** 10/11/06 11:24
Longitude: ___ ___ ___ **End:** __/__/__ __:__

Laboratory Analyses:

Container	Preservative	Holding Time	Analysis
1 - 8 oz glass	4 Deg C	180 Days	1 Metals In Solids by ICP

Sample Comments:

(N/A) 123 ppm

[redacted]

Sample Collected By: RC

Sample Collection Field Sheet
US EPA Region 7
Kansas City, KS

ASR Number: 3155 **Sample Number:** 22 **QC Code:** __ **Matrix:** Solid **Tag ID:** 3155-22-__

Project ID: EMA78Q00 **Project Manager:** Eddie McGlasson
Project Desc: United Zinc No. 1 site sampling
City: Iola **State:** Kansas
Program: Superfund
Site Name: United Zinc No. 1 - **Site ID:** A78Q **Site OU:** 00

Location Desc: EPA # 672, Cell 5

External Sample Number: _____

Expected Conc: (or Circle One: Low Medium High) **Date** **Time(24 hr)**

Latitude: ___ ___ ___ **Sample Collection: Start:** 10/11/06 13:45
Longitude: ___ ___ ___ **End:** __/__/__ __:__

Laboratory Analyses:

Container	Preservative	Holding Time	Analysis
1 - 8 oz glass	4 Deg C	180 Days	1 Metals in Solids by ICP

Sample Comments:

(N/A) 141 ppm

[redacted]

Sample Collected By: RC

Sample Collection Field Sheet
US EPA Region 7
Kansas City, KS

ASR Number: 3155 **Sample Number:** 23 **QC Code:** __ **Matrix:** Solid **Tag ID:** 3155-23-__

Project ID: EMA78Q00 **Project Manager:** Eddie McGlasson
Project Desc: United Zinc No. 1 site sampling
City: Iola **State:** Kansas
Program: Superfund
Site Name: United Zinc No. 1 - **Site ID:** A78Q **Site OU:** 00

Location Desc: EPA #688, Cell 1

External Sample Number: _____

Expected Conc: (or Circle One: Low Medium High) **Date** **Time(24 hr)**

Latitude: ___ ___ ___ **Sample Collection: Start:** 10/11/06 15:30
Longitude: ___ ___ ___ **End:** __/__/__ __:__

Laboratory Analyses:

Container	Preservative	Holding Time	Analysis
1 - 8 oz glass	4 Deg C	180 Days	1 Metals in Solids by ICP

Sample Comments:
(N/A) 117 pp[redacted]

Sample Collected By: RC

Sample Collection Field Sheet
US EPA Region 7
Kansas City, KS

ASR Number: 3155 **Sample Number:** 24 **QC Code:** __ **Matrix:** Solid **Tag ID:** 3155-24-__

Project ID: EMA78Q00 **Project Manager:** Eddie McGlasson
Project Desc: United Zinc No. 1 site sampling
City: Iola **State:** Kansas
Program: Superfund
Site Name: United Zinc No. 1 - **Site ID:** A78Q **Site OU:** 00

Location Desc: EPA #676, Cell 2

External Sample Number: _____

Expected Conc: (or Circle One: Low Medium High) **Date** **Time(24 hr)**

Latitude: ___ ___ ___ **Sample Collection: Start:** 10/11/06 16:18
Longitude: ___ ___ ___ **End:** __/__/__ __:__

Laboratory Analyses:

Container	Preservative	Holding Time	Analysis
1 - 8 oz glass	4 Deg C	180 Days	1. Metals in Solids by ICP

Sample Comments:
(N/A) 137 ppm

[redacted]

Sample Collected By: RC

Sample Collection Field Sheet
US EPA Region 7
Kansas City, KS

ASR Number: 3155 **Sample Number:** 25 **QC Code:** __ **Matrix:** Solid **Tag ID:** 3155-25-__

Project ID: EMA78Q00 **Project Manager:** Eddie McGlasson
Project Desc: United Zinc No. 1 site sampling
City: Iola **State:** Kansas
Program: Superfund
Site Name: United Zinc No. 1 - **Site ID:** A78Q **Site OU:** 00

Location Desc: EPA 366 C #1

External Sample Number: _____

Expected Conc: (or Circle One: Low Medium High) **Date** **Time(24 hr)**

Latitude: ___ ___ ___ **Sample Collection: Start:** 10/11/06 16:30
Longitude: ___ ___ ___ **End:** __/__/__ __:__

Laboratory Analyses:

Container	Preservative	Holding Time	Analysis
1 - 8 oz glass	4 Deg C	180 Days	1 Metals in Solids by ICP

Sample Comments:
(N/A)

411 S. Cottonwood

Sample Collected By: RC

Sample Collection Field Sheet
US EPA Region 7
Kansas City, KS

ASR Number: 3155 **Sample Number:** 26 **QC Code:** __ **Matrix:** Solid **Tag ID:** 3155-26-__

Project ID: EMA78Q00 **Project Manager:** Eddie McGlasson
Project Desc: United Zinc No. 1 site sampling
City: Iola **State:** Kansas
Program: Superfund
Site Name: United Zinc No. 1 - **Site ID:** A78Q **Site OU:** 00

Location Desc: EPA 725 C #1

External Sample Number: _____

Expected Conc: (or Circle One: Low Medium High) **Date** **Time(24 hr)**

Latitude: ___ ___ ___ **Sample Collection: Start:** 10/12/06 09:20
Longitude: ___ ___ ___ **End:** __/__/__ __:__

Laboratory Analyses:

Container	Preservative	Holding Time	Analysis
1 - 8 oz glass	4 Deg C	180 Days	1 Metals in Solids by ICP

Sample Comments:
(N/A) 422 East st.

Sample Collected By: RC

Sample Collection Field Sheet
US EPA Region 7
Kansas City, KS

ASR Number: 3155 **Sample Number:** 27 **QC Code:** __ **Matrix:** Solid **Tag ID:** 3155-27-__

Project ID: EMA78Q00 **Project Manager:** Eddie McGlasson
Project Desc: United Zinc No. 1 site sampling
City: Iola **State:** Kansas
Program: Superfund
Site Name: United Zinc No. 1 - **Site ID:** A78Q **Site OU:** 00

Location Desc: EPA 717 C #1

External Sample Number: _____

Expected Conc: (or Circle One: Low Medium High) **Date** **Time(24 hr)**

Latitude: __ __ __ **Sample Collection: Start:** 10/12/06 11:00
Longitude: __ __ __ **End:** __/__/__ __:__

Laboratory Analyses:

Container	Preservative	Holding Time	Analysis
1 - 8 oz glass	4 Deg C	180 Days	1 Metals in Solids by ICP

Sample Comments:
(N/A) 701 Norfolk St.

Sample Collected By: RC

Sample Collection Field Sheet
US EPA Region 7
Kansas City, KS

ASR Number: 3155 **Sample Number:** 28 **QC Code:** __ **Matrix:** Solid **Tag ID:** 3155-28-__

Project ID: EMA78Q00 **Project Manager:** Eddie McGlasson
Project Desc: United Zinc No. 1 site sampling
City: Iola **State:** Kansas
Program: Superfund
Site Name: United Zinc No. 1 - **Site ID:** A78Q **Site OU:** 00

Location Desc: EPA # 679 Cell 4

External Sample Number: _____

Expected Conc: (or Circle One: Low Medium High) **Date** **Time(24 hr)**

Latitude: ___ ___ ___ **Sample Collection: Start:** 10/12/06 11:07
Longitude: ___ ___ ___ **End:** __/__/__ __:__

Laboratory Analyses:

Container	Preservative	Holding Time	Analysis
1 - 8 oz glass	4 Deg C	180 Days	1 Metals in Solids by ICP

Sample Comments:

(N/A) Pre-lab: 130ppm

[redacted]

Sample Collected By: RC

Sample Collection Field Sheet
US EPA Region 7
Kansas City, KS

ASR Number: 3155 **Sample Number:** 29 **QC Code:** __ **Matrix:** Solid **Tag ID:** 3155-29-__

Project ID: EMA78Q00 **Project Manager:** Eddie McGlasson
Project Desc: United Zinc No. 1 site sampling
City: Iola **State:** Kansas
Program: Superfund
Site Name: United Zinc No. 1 - **Site ID:** A78Q **Site OU:** 00

Location Desc: EPA # 680, cell 1

External Sample Number: _____

Expected Conc: (or Circle One: Low Medium High) **Date** **Time(24 hr)**

Latitude: ___ ___ ___ **Sample Collection: Start:** 10/12/06 11:45
Longitude: ___ ___ ___ **End:** __/__/__ __:__

Laboratory Analyses:

Container	Preservative	Holding Time	Analysis
1 - 8 oz glass	4 Deg C	180 Days	1 Metals In Solids by ICP

Sample Comments:
(N/A) 220 ppm

[redacted]

Sample Collected By: RC

Sample Collection Field Sheet
US EPA Region 7
Kansas City, KS

ASR Number: 3155 **Sample Number:** 30 **QC Code:** __ **Matrix:** Solid **Tag ID:** 3155-30-__

Project ID: EMA78Q00 **Project Manager:** Eddie McGlasson
Project Desc: United Zinc No. 1 site sampling
City: Iola **State:** Kansas
Program: Superfund
Site Name: United Zinc No. 1 - **Site ID:** A78Q **Site OU:** 00

Location Desc: EPA # 703 cell 3

External Sample Number: _____

Expected Conc: (or Circle One: Low Medium High) **Date** **Time(24 hr)**

Latitude: ___ ___ ___ **Sample Collection: Start:** 10/12/06 14:15
Longitude: ___ ___ ___ **End:** __/__/__ __:__

Laboratory Analyses:

Container	Preservative	Holding Time	Analysis
1 - 8 oz glass	4 Deg C	180 Days	1 Metals in Solids by ICP

Sample Comments:

(N/A) 253 ppm

[redacted]

Sample Collected By: RC

Sample Collection Field Sheet
US EPA Region 7
Kansas City, KS

ASR Number: 3155 **Sample Number:** 31 **QC Code:** __ **Matrix:** Solid **Tag ID:** 3155-31-__

Project ID: EMA78Q00 **Project Manager:** Eddie McGlasson
Project Desc: United Zinc No. 1 site sampling
City: Iola **State:** Kansas
Program: Superfund
Site Name: United Zinc No. 1 - **Site ID:** A78Q **Site OU:** 00

Location Desc: EPA #694 Cell 1

External Sample Number: _____

Expected Conc: (or Circle One: Low Medium High) **Date** **Time(24 hr)**

Latitude: ___ ___ ___ **Sample Collection: Start:** 10/12/06 16:40
Longitude: ___ ___ ___ **End:** __/__/__ __:__

Laboratory Analyses:

Container	Preservative	Holding Time	Analysis
1 - 8 oz glass	4 Deg C	180 Days	1 Metals in Solids b[redacted] ICP

Sample Comments:

(N/A) 297 ppm [redacted]

Sample Collected By: RC

Sample Collection Field Sheet
US EPA Region 7
Kansas City, KS

ASR Number: 3155 **Sample Number:** 32 **QC Code:** __ **Matrix:** Solid **Tag ID:** 3155-32-__

Project ID: EMA78Q00 **Project Manager:** Eddie McGlasson
Project Desc: United Zinc No. 1 site sampling
City: Iola **State:** Kansas
Program: Superfund
Site Name: United Zinc No. 1 - **Site ID:** A78Q **Site OU:** 00

Location Desc: EPA# C35 cell 2

External Sample Number: _____

Expected Conc: (or Circle One: Low Medium High) **Date** **Time(24 hr)**

Latitude: ___ ___ ___ **Sample Collection: Start:** 10/13/06 09:55
Longitude: ___ ___ ___ **End:** __/__/__ __:__

Laboratory Analyses:

Container	Preservative	Holding Time	Analysis
1 - 8 oz glass	4 Deg C	180 Days	1 Metals In Solids by [redacted]

Sample Comments:

(N/A) 187 ppm

[redacted]

Sample Collected By: RC

Sample Collection Field Sheet
US EPA Region 7
Kansas City, KS

ASR Number: 3155 **Sample Number:** 33 **QC Code:** __ **Matrix:** Solid **Tag ID:** 3155-33-__

Project ID: EMA78Q00 **Project Manager:** Eddie McGlasson
Project Desc: United Zinc No. 1 site sampling
City: Iola **State:** Kansas
Program: Superfund
Site Name: United Zinc No. 1 - **Site ID:** A78Q **Site OU:** 00

Location Desc: EPA #699 Cell 2

External Sample Number: _____

Expected Conc: (or Circle One: Low Medium High) **Date** **Time(24 hr)**

Latitude: __ __ __ **Sample Collection: Start:** 10/13/04 09:50
Longitude: __ __ __ **End:** __/__/__ __:__

Laboratory Analyses:

Container	Preservative	Holding Time	Analysis
1 - 8 oz glass	4 Deg C	180 Days	1 Metals In Solids by ICP

Sample Comments:

(N/A) 482/469 ppm

301 E. Broadway
Iola, KS 66749

Sample Collected By: RC

CHAIN OF CUSTODY RECORD
ENVIRONMENTAL PROTECTION AGENCY REGION VII

ACTIVITY LEADER(Print)	NAME OF SURVEY OR ACTIVITY	DATE OF COLLECTION	SHEET
Eddie McGlasson	United Zinc #1 Removal	16-20 (DAY) 10 (MONTH) 06 (YEAR)	1 of 2

CONTENTS OF SHIPMENT

SAMPLE NUMBER EMA78Q00	TYPE OF CONTAINERS: CUBITAINER	glass BOTTLE	BOTTLE	BOTTLE	VOA SET (2 VIALS EA)	SAMPLED MEDIA: water	soil	sediment	dust	other	RECEIVING LABORATORY REMARKS/OTHER INFORMATION (condition of samples upon receipt other sample numbers, etc.)
	NUMBERS OF CONTAINERS PER SAMPLE NUMBER										
3156-1		1					✓				
2		1					✓				
3		1					✓				
4		1					✓				
5		1					✓				
6		1					✓				
7		1					✓				
8		1					✓				
9		1					✓				
10		1					✓				
11		1					✓				
12		1					✓				
13		1					✓				
14		1					✓				
15		1					✓				
16		1					✓				
17		1					✓				
18		1					✓				
19		1					✓				
20		1					✓				
21		1					✓				
22		1					✓				
23		1					✓				
24		1					✓				

DESCRIPTION OF SHIPMENT

____ PIECE(S) CONSISTING OF ____ BOX(ES)

1 ICE CHEST(S), OTHER ____

MODE OF SHIPMENT

____ COMMERCIAL CARRIER ____

____ COURIER

X SAMPLER CONVEYED

____ (SHIPPING DOCUMENT NUMBER)

PERSONNEL CUSTODY RECORD

RELINQUISHED BY (SAMPLER)	DATE	TIME	RECEIVED BY	REASON FOR CHANGE OF CUSTODY
☐ SEALED UNSEALED ☐			☐ SEALED UNSEALED ☐	
RELINQUISHED BY	DATE	TIME	RECEIVED BY	REASON FOR CHANGE OF CUSTODY
☐ SEALED UNSEALED ☐			☐ SEALED UNSEALED ☐	
RELINQUISHED BY	DATE	TIME	RECEIVED BY	REASON FOR CHANGE OF CUSTODY
☐ SEALED UNSEALED ☐			☐ SEALED UNSEALED ☐	

7-EPA-9262(Revised 5/85)

*U.S. GPO, 2002-756-917/40053

CHAIN OF CUSTODY RECORD
ENVIRONMENTAL PROTECTION AGENCY REGION VII

ACTIVITY LEADER(Print)	NAME OF SURVEY OR ACTIVITY	DATE OF COLLECTION (DAY / MONTH / YEAR)	SHEET
Eddie McGlasson	United Zinc #1 Removal	19 / 10 / 06	2 of 2

CONTENTS OF SHIPMENT

SAMPLE NUMBER EMA7X000	TYPE OF CONTAINERS: CUBITAINER	GLASS BOTTLE	BOTTLE	BOTTLE	VOA SET (2 VIALS EA)	SAMPLED MEDIA: water	soil	sediment	dust	other	RECEIVING LABORATORY REMARKS/OTHER INFORMATION (condition of samples upon receipt other sample numbers etc.)
	NUMBERS OF CONTAINERS PER SAMPLE NUMBER										
3156-25		1									
26		1									
27		1									
28		1									
29		1									
30		1									
31		1									
32		1									
33		1									
34		1									
35		1									
36		1									
37		1									

Nothing More to Follow

DESCRIPTION OF SHIPMENT

_____ PIECE(S) CONSISTING OF _____ BOX(ES)

1 ICE CHEST(S): OTHER _____

MODE OF SHIPMENT

_____ COMMERCIAL CARRIER _____

_____ COURIER

X SAMPLER CONVEYED

_____ (SHIPPING DOCUMENT NUMBER)

PERSONNEL CUSTODY RECORD

RELINQUISHED BY (SAMPLER)	DATE	TIME	RECEIVED BY	REASON FOR CHANGE OF CUSTODY
SEALED UNSEALED			SEALED UNSEALED	
RELINQUISHED BY	DATE	TIME	RECEIVED BY	REASON FOR CHANGE OF CUSTODY
SEALED UNSEALED			SEALED UNSEALED	
RELINQUISHED BY	DATE	TIME	RECEIVED BY	REASON FOR CHANGE OF CUSTODY
SEALED UNSEALED			SEALED UNSEALED	

7-EPA-9262(Revised 5/85)

*U.S GPO: 2002-756-917/40053

Sample Collection Field Sheet
US EPA Region 7
Kansas City, KS

ASR Number: 3156 **Sample Number:** 1 **QC Code:** __ **Matrix:** Solid **Tag ID:** 3156-1-__

Project ID: EMA78Q00 **Project Manager:** Eddie McGlasson
Project Desc: United Zinc No. 1 site sampling
City: Iola **State:** Kansas
Program: Superfund
Site Name: United Zinc No. 1 - **Site ID:** A78Q **Site OU:** 00

Location Desc: EPA 729 C #1

External Sample Number: _____

Expected Conc: (or Circle One: Low Medium High) **Date** **Time(24 hr)**

Latitude: ___ ___ ___ **Sample Collection: Start:** 10/16/06 17:15
Longitude: ___ ___ ___ **End:** __/__/__ __:__

Laboratory Analyses:

Container	Preservative	Holding Time	Analysis
1 - 8 oz glass	4 Deg C	180 Days	1 Metals in Solids by ICP

Sample Comments:
(N/A)

525 S 3rd

Sample Collected By: RC RD

Sample Collection Field Sheet
US EPA Region 7
Kansas City, KS

ASR Number: 3156 **Sample Number:** 2 **QC Code:** __ **Matrix:** Solid **Tag ID:** 3156-2-__

Project ID: EMA78Q00 **Project Manager:** Eddie McGlasson
Project Desc: United Zinc No. 1 site sampling
City: Iola **State:** Kansas
Program: Superfund
Site Name: United Zinc No. 1 - **Site ID:** A78Q **Site OU:** 00

Location Desc: EPA # 771 ~~#87~~ Cell 3

External Sample Number: _____

Expected Conc: (or Circle One: Low Medium High) **Date** **Time(24 hr)**

Latitude: ___ ___ ___ **Sample Collection: Start:** 10/16/06 11:47
Longitude: ___ ___ ___ **End:** __/__/__ __:__

Laboratory Analyses:

Container	Preservative	Holding Time	Analysis
1 - 8 oz glass	4 Deg C	180 Days	1 Metals in Solids by ICP

Sample Comments:
(N/A) Pre-lab average: 1420 ppm 822 South St.

Sample Collected By: RC

Sample Collection Field Sheet
US EPA Region 7
Kansas City, KS

ASR Number: 3156 **Sample Number:** 3 **QC Code:** __ **Matrix:** Solid **Tag ID:** 3156-3-__

Project ID: EMA78Q00 **Project Manager:** Eddie McGlasson
Project Desc: United Zinc No. 1 site sampling
City: Iola **State:** Kansas
Program: Superfund
Site Name: United Zinc No. 1 - **Site ID:** A78Q **Site OU:** 00

Location Desc: EPA # 74B Cell 1

External Sample Number: _____

Expected Conc: (or Circle One: Low Medium High) **Date** **Time(24 hr)**

Latitude: ___ ___ ___ **Sample Collection: Start:** 10/16/06 13:09
Longitude: ___ ___ ___ **End:** __/__/__ __:__

Laboratory Analyses:

Container	Preservative	Holding Time	Analysis
1 - 8 oz glass	4 Deg C	180 Days	1 Metals in Solids by ICP

Sample Comments:
(N/A) Pre-lab average 245 ppm 319 E. Irwin

Sample Collected By: RC

Sample Collection Field Sheet
US EPA Region 7
Kansas City, KS

ASR Number: 3156 **Sample Number:** 4 **QC Code:** __ **Matrix:** Solid **Tag ID:** 3156-4-__

Project ID: EMA78Q00 **Project Manager:** Eddie McGlasson
Project Desc: United Zinc No. 1 site sampling
City: Iola **State:** Kansas
Program: Superfund
Site Name: United Zinc No. 1 - **Site ID:** A78Q **Site OU:** 00

Location Desc: EPA # 739 Cell 2

External Sample Number: _____

Expected Conc: (or Circle One: Low Medium High) **Date** **Time(24 hr)**

Latitude: ___ ___ ___ **Sample Collection: Start:** 10/14/06 16:45

Longitude: ___ ___ ___ **End:** __/__/__ __:__

Laboratory Analyses:

Container	Preservative	Holding Time	Analysis
1 - 8 oz glass	4 Deg C	180 Days	1 Metals in Solids by ICP

Sample Comments:

(N/A) Pre-lab average 607 ppm 220 N. Colborn

Sample Collected By: RC

Sample Collection Field Sheet
US EPA Region 7
Kansas City, KS

ASR Number: 3156 **Sample Number:** 5 **QC Code:** __ **Matrix:** Solid **Tag ID:** 3156-5-__

Project ID: EMA78Q00 **Project Manager:** Eddie McGlasson
Project Desc: United Zinc No. 1 site sampling
City: Iola **State:** Kansas
Program: Superfund
Site Name: United Zinc No. 1 - **Site ID:** A78Q **Site OU:** 00

Location Desc: EPA 755 C #4

External Sample Number: _____

Expected Conc: (or Circle One: Low Medium High) **Date** **Time(24 hr)**

Latitude: ___ ___ ___ **Sample Collection: Start:** 10/17/06 10:45
Longitude: ___ ___ ___ **End:** __/__/__ __:__

Laboratory Analyses:

Container	Preservative	Holding Time	Analysis
1 - 8 oz glass	4 Deg C	180 Days	1 Metals in Solids by ICP

Sample Comments:
(N/A) 423 S. Chestnut

Sample Collected By: RC

Sample Collection Field Sheet
US EPA Region 7
Kansas City, KS

ASR Number: 3156 **Sample Number:** 6 **QC Code:** __ **Matrix:** Solid **Tag ID:** 3156-6-__

Project ID: EMA78Q00 **Project Manager:** Eddie McGlasson
Project Desc: United Zinc No. 1 site sampling
City: Iola **State:** Kansas
Program: Superfund
Site Name: United Zinc No. 1 - **Site ID:** A78Q **Site OU:** 00

Location Desc: EPA # 745 Cell 4

External Sample Number: _____

Expected Conc: (or Circle One: Low Medium High) **Date** **Time(24 hr)**

Latitude: ___ ___ ___ **Sample Collection: Start:** 10/17/06 11:01
Longitude: ___ ___ ___ **End:** __/__/__ __:__

Laboratory Analyses:

Container	Preservative	Holding Time	Analysis
1 - 8 oz glass	4 Deg C	180 Days	1 Metals in Solids by ICP

Sample Comments:
(N/A) Pre-lab: 247 ppm 407 S. Elm

Sample Collected By: RC

Sample Collection Field Sheet
US EPA Region 7
Kansas City, KS

ASR Number: 3156 **Sample Number:** 7 **QC Code:** __ **Matrix:** Solid **Tag ID:** 3156-7-__

Project ID: EMA78Q00 **Project Manager:** Eddie McGlasson
Project Desc: United Zinc No. 1 site sampling
City: Iola **State:** Kansas
Program: Superfund
Site Name: United Zinc No. 1 - **Site ID:** A78Q **Site OU:** 00

Location Desc: EPA # 746 Cell 1

External Sample Number: _____

Expected Conc: (or Circle One: Low Medium High)

		Date	Time(24 hr)
Latitude: ___ ___ ___	**Sample Collection: Start:**	10/12/06	11:44
Longitude: ___ ___ ___	**End:**	__/__/__	__:__

Laboratory Analyses:

Container	Preservative	Holding Time	Analysis
1 - 8 oz glass	4 Deg C	180 Days	1 Metals in Solids by ICP

Sample Comments:

(N/A) Pre-lab avg: 290 ppm 206 S. Elm

Sample Collected By: RC

Sample Collection Field Sheet
US EPA Region 7
Kansas City, KS

ASR Number: 3156 **Sample Number:** 8 **QC Code:** __ **Matrix:** Solid **Tag ID:** 3156-8-__

Project ID: EMA78Q00 **Project Manager:** Eddie McGlasson
Project Desc: United Zinc No. 1 site sampling
City: Iola **State:** Kansas
Program: Superfund
Site Name: United Zinc No. 1 - **Site ID:** A78Q **Site OU:** 00

Location Desc: EPA #753 Cell 1

External Sample Number: _____

Expected Conc: (or Circle One: Low Medium High) **Date** **Time(24 hr)**

Latitude: ___ ___ ___ **Sample Collection: Start:** 10/17/06 12:55

Longitude: ___ ___ ___ **End:** __/__/__ __:__

Laboratory Analyses:

Container	Preservative	Holding Time	Analysis
1 - 8 oz glass	4 Deg C	180 Days	1 Metals in Solids by ICP

Sample Comments:

(N/A) Pre-lab avg: 365 ppm 319 S. Walnut

Sample Collected By: RC

Sample Collection Field Sheet
US EPA Region 7
Kansas City, KS

ASR Number: 3156 **Sample Number:** 9 **QC Code:** __ **Matrix:** Solid **Tag ID:** 3156-9-__

Project ID: EMA78Q00 **Project Manager:** Eddie McGlasson
Project Desc: United Zinc No. 1 site sampling
City: Iola **State:** Kansas
Program: Superfund
Site Name: United Zinc No. 1 - **Site ID:** A78Q **Site OU:** 00

Location Desc: EPA # 617 Cell 3

External Sample Number: _____

Expected Conc: (or Circle One: Low Medium High) **Date** **Time(24 hr)**

Latitude: ___ ___ ___ **Sample Collection: Start:** 10/17/06 14:33
Longitude: ___ ___ ___ **End:** __/__/__ __:__

Laboratory Analyses:

Container	Preservative	Holding Time	Analysis
1 - 8 oz glass	4 Deg C	180 Days	1 Metals in Solids by ICP

Sample Comments:
(N/A) Pre-lab avg: 150 ppm 519 N. Washington

Sample Collected By: RC

Sample Collection Field Sheet
US EPA Region 7
Kansas City, KS

ASR Number: 3156 **Sample Number:** 10 **QC Code:** __ **Matrix:** Solid **Tag ID:** 3156-10-__

Project ID: EMA78Q00 **Project Manager:** Eddie McGlasson
Project Desc: United Zinc No. 1 site sampling
City: Iola **State:** Kansas
Program: Superfund
Site Name: United Zinc No. 1 - **Site ID:** A78Q **Site OU:** 00

Location Desc: EPA # 775 Cell 2

External Sample Number: _____

Expected Conc: (or Circle One: Low Medium High) **Date** **Time(24 hr)**

Latitude: ___ ___ ___ **Sample Collection: Start:** 10/17/06 15:54
Longitude: ___ ___ ___ **End:** __/__/__ __:__

Laboratory Analyses:

Container	Preservative	Holding Time	Analysis
1 - 8 oz glass	4 Deg C	180 Days	1 Metals in Solids by ICP

Sample Comments:
(N/A) Pre-lab avg: 923 ppm 522 N Washington

Sample Collected By: RC

Sample Collection Field Sheet
US EPA Region 7
Kansas City, KS

ASR Number: 3156 **Sample Number:** 11 **QC Code:** __ **Matrix:** Solid **Tag ID:** 3156-11-__

Project ID: EMA78Q00 **Project Manager:** Eddie McGlasson
Project Desc: United Zinc No. 1 site sampling
City: Iola **State:** Kansas
Program: Superfund
Site Name: United Zinc No. 1 - **Site ID:** A78Q **Site OU:** 00

Location Desc: EPA 621 C #4

External Sample Number: _____

Expected Conc: (or Circle One: Low Medium High) **Date** **Time(24 hr)**

Latitude: ___ ___ ___ **Sample Collection: Start:** 10/18/06 14:10
Longitude: ___ ___ ___ **End:** __/__/__ __:__

Laboratory Analyses:

Container	Preservative	Holding Time	Analysis
1 - 8 oz glass	4 Deg C	180 Days	1 Metals in Solids by ICP

Sample Comments:
(N/A)

617 E Broadway

Sample Collected By: RC

Sample Collection Field Sheet
US EPA Region 7
Kansas City, KS

ASR Number: 3156 **Sample Number:** 12 **QC Code:** __ **Matrix:** Solid **Tag ID:** 3156-12-__

Project ID: EMA78Q00 **Project Manager:** Eddie McGlasson
Project Desc: United Zinc No. 1 site sampling
City: Iola **State:** Kansas
Program: Superfund
Site Name: United Zinc No. 1 - **Site ID:** A78Q **Site OU:** 00

Location Desc: EPA 781 C #1

External Sample Number: _____

Expected Conc: (or Circle One: Low Medium High) **Date** **Time(24 hr)**

Latitude: ___ ___ ___ **Sample Collection: Start:** 10/18/06 15:25
Longitude: ___ ___ ___ **End:** __/__/__ __:__

Laboratory Analyses:

Container	Preservative	Holding Time	Analysis
1 - 8 oz glass	4 Deg C	180 Days	1 Metals in Solids by ICP

Sample Comments:
(N/A)

203 S. Sycamore

Sample Collected By: ~~RE~~ QD

Sample Collection Field Sheet
US EPA Region 7
Kansas City, KS

ASR Number: 3156 **Sample Number:** 13 **QC Code:** __ **Matrix:** Solid **Tag ID:** 3156-13-__

Project ID: EMA78Q00 **Project Manager:** Eddie McGlasson
Project Desc: United Zinc No. 1 site sampling
City: Iola **State:** Kansas
Program: Superfund
Site Name: United Zinc No. 1 - **Site ID:** A78Q **Site OU:** 00

Location Desc: EPA # 647, cell 4

External Sample Number: _____

Expected Conc: (or Circle One: Low Medium High) **Date** **Time(24 hr)**

Latitude: ___ ___ ___ **Sample Collection: Start:** 10/18/06 13:24
Longitude: ___ ___ ___ **End:** __/__/__ __:__

Laboratory Analyses:

Container	Preservative	Holding Time	Analysis
1 - 8 oz glass	4 Deg C	180 Days	1 Metals in Solids by ICP

Sample Comments:
(N/A)
pre lab level/avg: 227ppm
404 N. Jefferson

Sample Collected By: RC

Sample Collection Field Sheet
US EPA Region 7
Kansas City, KS

ASR Number: 3156 **Sample Number:** 14 **QC Code:** __ **Matrix:** Solid **Tag ID:** 3156-14-__

Project ID: EMA78Q00 **Project Manager:** Eddie McGlasson
Project Desc: United Zinc No. 1 site sampling
City: Iola **State:** Kansas
Program: Superfund
Site Name: United Zinc No. 1 - **Site ID:** A78Q **Site OU:** 00

Location Desc: EPA #632, Cell 3

External Sample Number: _____

Expected Conc: (or Circle One: Low Medium High) **Date** **Time(24 hr)**

Latitude: ___ ___ ___ **Sample Collection: Start:** 10/18/04 10:39
Longitude: ___ ___ ___ **End:** __/__/__ __:__

Laboratory Analyses:

Container	Preservative	Holding Time	Analysis
1 - 8 oz glass	4 Deg C	180 Days	1 Metals in Solids by ICP

Sample Comments:
(N/A)

prelab avg: 331 ppm
610 N. Washington

Sample Collected By: RC

Sample Collection Field Sheet
US EPA Region 7
Kansas City, KS

ASR Number: 3156 **Sample Number:** 15 **QC Code:** __ **Matrix:** Solid **Tag ID:** 3156-15-__

Project ID: EMA78Q00 **Project Manager:** Eddie McGlasson
Project Desc: United Zinc No. 1 site sampling
City: Iola **State:** Kansas
Program: Superfund
Site Name: United Zinc No. 1 - **Site ID:** A78Q **Site OU:** 00

Location Desc: EPA # 648, Cell 2

External Sample Number: _____

Expected Conc: (or Circle One: Low Medium High) **Date** **Time(24 hr)**

Latitude: ___ ___ ___ **Sample Collection: Start:** 10/18/06 13:56
Longitude: ___ ___ ___ **End:** __/__/__ __:__

Laboratory Analyses:

Container	Preservative	Holding Time	Analysis
1 - 8 oz glass	4 Deg C	180 Days	1 Metals in Solids by ICP

Sample Comments:
(N/A)

pre lab level: 759 ppm

410 N. Jefferson

Sample Collected By: RC

Sample Collection Field Sheet
US EPA Region 7
Kansas City, KS

ASR Number: 3156 **Sample Number:** 16 **QC Code:** __ **Matrix:** Solid **Tag ID:** 3156-16-__

Project ID: EMA78Q00 **Project Manager:** Eddie McGlasson
Project Desc: United Zinc No. 1 site sampling
City: Iola **State:** Kansas
Program: Superfund
Site Name: United Zinc No. 1 - **Site ID:** A78Q **Site OU:** 00

Location Desc: EPA #651, Cell 3

External Sample Number: _____

Expected Conc: (or Circle One: Low Medium High) **Date** **Time(24 hr)**

Latitude: ___ ___ ___ **Sample Collection: Start:** 10/18/06 17:27
Longitude: ___ ___ ___ **End:** __/__/__ __:__

Laboratory Analyses:

Container	Preservative	Holding Time	Analysis
1 - 8 oz glass	4 Deg C	180 Days	1 Metals in Solids by ICP

Sample Comments:
(N/A)

Epa prelab: 956 ppm

507 N. Jefferson

Sample Collected By: RC

Sample Collection Field Sheet
US EPA Region 7
Kansas City, KS

ASR Number: 3156 **Sample Number:** 17 **QC Code:** __ **Matrix:** Solid **Tag ID:** 3156-17-__

Project ID: EMA78Q00 **Project Manager:** Eddie McGlasson
Project Desc: United Zinc No. 1 site sampling
City: Iola **State:** Kansas
Program: Superfund
Site Name: United Zinc No. 1 - **Site ID:** A78Q **Site OU:** 00

Location Desc: EPA # 589, Drill 4

External Sample Number: _____

Expected Conc: (or Circle One: Low Medium High) **Date** **Time(24 hr)**

Latitude: ___ ___ ___ **Sample Collection: Start:** 10/18/06 08:48
Longitude: ___ ___ ___ **End:** __/__/__ __:__

Laboratory Analyses:

Container	Preservative	Holding Time	Analysis
1 - 8 oz glass	4 Deg C	180 Days	1 Metals in Solids by ICP

Sample Comments:
(N/A)

Epa prelab: 807 ppm
2 N 3rd

Sample Collected By: RC

Sample Collection Field Sheet
US EPA Region 7
Kansas City, KS

ASR Number: 3156 **Sample Number:** 18 **QC Code:** __ **Matrix:** Solid **Tag ID:** 3156-18-__

Project ID: EMA78Q00 **Project Manager:** Eddie McGlasson
Project Desc: United Zinc No. 1 site sampling
City: Iola **State:** Kansas
Program: Superfund
Site Name: United Zinc No. 1 - **Site ID:** A78Q **Site OU:** 00

Location Desc: EPA # 759, Cell 4

External Sample Number: _____

Expected Conc: (or Circle One: Low Medium High) **Date** **Time(24 hr)**

Latitude: ___ ___ ___ **Sample Collection: Start:** 10/19/06 16:43
Longitude: ___ ___ ___ **End:** __/__/__ __:__

Laboratory Analyses:

Container	Preservative	Holding Time	Analysis
1 - 8 oz glass	4 Deg C	180 Days	1 Metals in Solids by ICP

Sample Comments:
(N/A)

pre lab avg. 829 ppm
521 N. Jefferson

Sample Collected By: RC

Sample Collection Field Sheet
US EPA Region 7
Kansas City, KS

ASR Number: 3156 **Sample Number:** 19 **QC Code:** __ **Matrix:** Solid **Tag ID:** 3156-19-__

Project ID: EMA78Q00 **Project Manager:** Eddie McGlasson
Project Desc: United Zinc No. 1 site sampling
City: Iola **State:** Kansas
Program: Superfund
Site Name: United Zinc No. 1 - **Site ID:** A78Q **Site OU:** 00

Location Desc: EPA # 443, Cell 1

External Sample Number: _____

Expected Conc: (or Circle One: Low Medium High) **Date** **Time(24 hr)**

Latitude: ___ ___ ___ **Sample Collection: Start:** 10/19/06 11:03

Longitude: ___ ___ ___ **End:** __/__/__ __:__

Laboratory Analyses:

Container	Preservative	Holding Time	Analysis
1 - 8 oz glass	4 Deg C	180 Days	1 Metals in Solids by ICP

Sample Comments:
(N/A)

prelab 1084 ppm avg.

619 N. Jefferson

Sample Collected By: RC

Sample Collection Field Sheet
US EPA Region 7
Kansas City, KS

ASR Number: 3156 **Sample Number:** 20 **QC Code:** __ **Matrix:** Solid **Tag ID:** 3156-20-__

Project ID: EMA78Q00 **Project Manager:** Eddie McGlasson
Project Desc: United Zinc No. 1 site sampling
City: Iola **State:** Kansas
Program: Superfund
Site Name: United Zinc No. 1 - **Site ID:** A78Q **Site OU:** 00

Location Desc: EPA # 692, Cell 1

External Sample Number: _____

Expected Conc: (or Circle One: Low Medium High) **Date** **Time(24 hr)**

Latitude: __ __ __ **Sample Collection: Start:** 10/19/06 11:35
Longitude: __ __ __ **End:** __/__/__ __:__

Laboratory Analyses:

Container	Preservative	Holding Time	Analysis
1 - 8 oz glass	4 Deg C	180 Days	1 Metals in Solids by ICP

Sample Comments:
(N/A)

prlab avg: 751 ppm

623 N Jefferson

Sample Collected By: RC

Sample Collection Field Sheet
US EPA Region 7
Kansas City, KS

ASR Number: 3156 **Sample Number:** 21 **QC Code:** __ **Matrix:** Solid **Tag ID:** 3156-21-__

Project ID: EMA78Q00 **Project Manager:** Eddie McGlasson
Project Desc: United Zinc No. 1 site sampling
City: Iola **State:** Kansas
Program: Superfund
Site Name: United Zinc No. 1 - **Site ID:** A78Q **Site OU:** 00

Location Desc: EPA #613, cell 4

External Sample Number: _____

Expected Conc: (or Circle One: Low Medium High) **Date** **Time(24 hr)**

Latitude: ___ ___ ___ **Sample Collection: Start:** 10/19/06 14:30
Longitude: ___ ___ ___ **End:** __/__/__ __:__

Laboratory Analyses:

Container	Preservative	Holding Time	Analysis
1 - 8 oz glass	4 Deg C	180 Days	1 Metals in Solids by ICP

Sample Comments:
(N/A)

EPA ~~PC~~ lab avg. 1370
524 N. Jefferson

Sample Collected By: RC

Sample Collection Field Sheet
US EPA Region 7
Kansas City, KS

ASR Number: 3156 **Sample Number:** 22 **QC Code:** __ **Matrix:** Solid **Tag ID:** 3156-22-__

Project ID: EMA78Q00 **Project Manager:** Eddie McGlasson
Project Desc: United Zinc No. 1 site sampling
City: Iola **State:** Kansas
Program: Superfund
Site Name: United Zinc No. 1 - **Site ID:** A78Q **Site OU:** 00

Location Desc: EPA # 400, cell 4

External Sample Number: _____

Expected Conc: (or Circle One: Low Medium High) **Date** **Time(24 hr)**

Latitude: ___ ___ ___ **Sample Collection: Start:** 10/19/00 09:54
Longitude: ___ ___ ___ **End:** __/__/__ __:__

Laboratory Analyses:

Container	Preservative	Holding Time	Analysis
1 - 8 oz glass	4 Deg C	180 Days	1 Metals in Solids by ICP

Sample Comments:
(N/A)

pre lab avg. 602 ppm
812 N. Jefferson

Sample Collected By: RC

Sample Collection Field Sheet
US EPA Region 7
Kansas City, KS

ASR Number: 3156 **Sample Number:** 23 **QC Code:** __ **Matrix:** Solid **Tag ID:** 3156-23-__

Project ID: EMA78Q00 **Project Manager:** Eddie McGlasson
Project Desc: United Zinc No. 1 site sampling
City: Iola **State:** Kansas
Program: Superfund
Site Name: United Zinc No. 1 - **Site ID:** A78Q **Site OU:** 00

Location Desc: EPA # 621, cell 2

External Sample Number: _____

Expected Conc: (or Circle One: Low Medium High) **Date** **Time(24 hr)**

Latitude: ___ ___ ___ **Sample Collection: Start:** 10/19/06 09:25
Longitude: ___ ___ ___ **End:** __/__/__ __:__

Laboratory Analyses:

Container	Preservative	Holding Time	Analysis
1 - 8 oz glass	4 Deg C	180 Days	1 Metals In Solids by ICP

Sample Comments:
(N/A)

Prelab, 509ppm

617 E. Broadway

Sample Collected By: RC

Sample Collection Field Sheet
US EPA Region 7
Kansas City, KS

ASR Number: 3156 **Sample Number:** 24 **QC Code:** __ **Matrix:** Solid **Tag ID:** 3156-24-__

Project ID: EMA78Q00 **Project Manager:** Eddie McGlasson
Project Desc: United Zinc No. 1 site sampling
City: Iola **State:** Kansas
Program: Superfund
Site Name: United Zinc No. 1 - **Site ID:** A78Q **Site OU:** 00

Location Desc: EPA # 793, 0113

External Sample Number: _____

Expected Conc: (or Circle One: Low Medium High) **Date** **Time(24 hr)**

Latitude: ___ ___ ___ **Sample Collection: Start:** 10/20/06 11:39
Longitude: ___ ___ ___ **End:** __/__/__ __:__

Laboratory Analyses:

Container	Preservative	Holding Time	Analysis
1 - 8 oz glass	4 Deg C	180 Days	1 Metals in Solids by ICP

Sample Comments:
(N/A)

pclab avg. 404ppm

702 S. 1st

Sample Collected By: RC

Sample Collection Field Sheet
US EPA Region 7
Kansas City, KS

ASR Number: 3156 **Sample Number:** 2~~1~~5 **QC Code:** __ **Matrix:** Solid **Tag ID:** 3156-2~~1~~5-__

Project ID: EMA78Q00 **Project Manager:** Eddie McGlasson
Project Desc: United Zinc No. 1 site sampling
City: Iola **State:** Kansas
Program: Superfund
Site Name: United Zinc No. 1 - **Site ID:** A78Q **Site OU:** 00

Location Desc: EPA # 750, Cell 1

External Sample Number: _____

Expected Conc: (or Circle One: Low Medium High) **Date** **Time(24 hr)**

Latitude: __ __ __ **Sample Collection: Start:** 10/19/06 15:05
Longitude: __ __ __ **End:** __/__/__ __:__

Laboratory Analyses:

Container	Preservative	Holding Time	Analysis
1 - 8 oz glass	4 Deg C	180 Days	1 Metals in Solids by ICP

Sample Comments:
(N/A)

prelab 492 ppm

816 E. Jackson

Sample Collected By: RC

Sample Collection Field Sheet
US EPA Region 7
Kansas City, KS

ASR Number: 3156 **Sample Number:** 26 **QC Code:** __ **Matrix:** Solid **Tag ID:** 3156-26-__

Project ID: EMA78Q00 **Project Manager:** Eddie McGlasson
Project Desc: United Zinc No. 1 site sampling
City: Iola **State:** Kansas
Program: Superfund
Site Name: United Zinc No. 1 - **Site ID:** A78Q **Site OU:** 00

Location Desc: EPA 810 , cell 4

External Sample Number: _____

Expected Conc: (or Circle One: Low Medium High) **Date** **Time(24 hr)**

Latitude: ___ ___ ___ **Sample Collection: Start:** 10/29/06 09:25
Longitude: ___ ___ ___ **End:** __/__/__ __:__

Laboratory Analyses:

Container	Preservative	Holding Time	Analysis
1 - 8 oz glass	4 Deg C	180 Days	1 Metals in Solids by ICP

Sample Comments:
(N/A)

prelab avg 451

520 E. Spruce

Sample Collected By: RC

Sample Collection Field Sheet
US EPA Region 7
Kansas City, KS

ASR Number: 3156 **Sample Number:** 27 **QC Code:** __ **Matrix:** Solid **Tag ID:** 3156-27-__

Project ID: EMA78Q00 **Project Manager:** Eddie McGlasson
Project Desc: United Zinc No. 1 site sampling
City: Iola **State:** Kansas
Program: Superfund
Site Name: United Zinc No. 1 - **Site ID:** A78Q **Site OU:** 00

Location Desc: EPA 446 C #3

External Sample Number: _____

Expected Conc: (or Circle One: Low Medium High) **Date** **Time(24 hr)**

Latitude: ___ ___ ___ **Sample Collection: Start:** 10/20/06 09:35
Longitude: ___ ___ ___ **End:** __/__/__ __:__

Laboratory Analyses:

Container	Preservative	Holding Time	Analysis
1 - 8 oz glass	4 Deg C	180 Days	1 Metals in Solids by ICP

Sample Comments:
(N/A)

411 N. Sycamore

Sample Collected By: RC

Sample Collection Field Sheet
US EPA Region 7
Kansas City, KS

ASR Number: 3156 **Sample Number:** 28 **QC Code:** __ **Matrix:** Solid **Tag ID:** 3156-28-__

Project ID: EMA78Q00 **Project Manager:** Eddie McGlasson
Project Desc: United Zinc No. 1 site sampling
City: Iola **State:** Kansas
Program: Superfund
Site Name: United Zinc No. 1 - **Site ID:** A78Q **Site OU:** 00

Location Desc: EPA 764 C#2

External Sample Number: _____

Expected Conc: (or Circle One: Low Medium High) **Date** **Time(24 hr)**

Latitude: ___ ___ ___ **Sample Collection: Start:** 10/23/06 14:55
Longitude: ___ ___ ___ **End:** __/__/__ __:__

Laboratory Analyses:

Container	Preservative	Holding Time	Analysis
1 - 8 oz glass	4 Deg C	180 Days	1 Metals in Solids by ICP

Sample Comments:
(N/A)

511 N. Oak

Sample Collected By: RC

Sample Collection Field Sheet
US EPA Region 7
Kansas City, KS

ASR Number: 3156 **Sample Number:** 29 **QC Code:** __ **Matrix:** Solid **Tag ID:** 3156-29-__

Project ID: EMA78Q00 **Project Manager:** Eddie McGlasson
Project Desc: United Zinc No. 1 site sampling
City: Iola **State:** Kansas
Program: Superfund
Site Name: United Zinc No. 1 - **Site ID:** A78Q **Site OU:** 00

Location Desc: 417 C1

External Sample Number: _____

Expected Conc: (or Circle One: Low Medium High) **Date** **Time(24 hr)**

Latitude: ___ ___ ___ **Sample Collection: Start:** 10/24/06 10:11
Longitude: ___ ___ ___ **End:** __/__/__ __:__

Laboratory Analyses:

Container	Preservative	Holding Time	Analysis
1 - 8 oz glass	4 Deg C	180 Days	1 Metals in Solids by ICP

Sample Comments:
(N/A)

505 N Sycamore

Sample Collected By: RC

Sample Collection Field Sheet
US EPA Region 7
Kansas City, KS

ASR Number: 3156 **Sample Number:** 30 **QC Code:** __ **Matrix:** Solid **Tag ID:** 3156-30-__

Project ID: EMA78Q00 **Project Manager:** Eddie McGlasson
Project Desc: United Zinc No. 1 site sampling
City: Iola **State:** Kansas
Program: Superfund
Site Name: United Zinc No. 1 - **Site ID:** A78Q **Site OU:** 00

Location Desc: 796 C1

External Sample Number: _____

Expected Conc: (or Circle One: Low Medium High) **Date** **Time(24 hr)**

Latitude: ___ ___ ___ **Sample Collection: Start:** 10/28/06 16:58
Longitude: ___ ___ ___ **End:** __/__/__ __:__

Laboratory Analyses:

Container	Preservative	Holding Time	Analysis
1 - 8 oz glass	4 Deg C	180 Days	1 Metals in Solids by ICP

Sample Comments:
(N/A) 514 E Jackson

Sample Collected By: RC

Sample Collection Field Sheet
US EPA Region 7
Kansas City, KS

ASR Number: 3156 **Sample Number:** 31 **QC Code:** __ **Matrix:** Solid **Tag ID:** 3156-31-__

Project ID: EMA78Q00 **Project Manager:** Eddie McGlasson
Project Desc: United Zinc No. 1 site sampling
City: Iola **State:** Kansas
Program: Superfund
Site Name: United Zinc No. 1 - **Site ID:** A78Q **Site OU:** 00

Location Desc: EPA# 805 Cell #1

External Sample Number: _____

Expected Conc: (or Circle One: Low Medium High) **Date** **Time(24 hr)**

Latitude: ___ ___ ___ **Sample Collection: Start:** 10/24/06 14:43
Longitude: ___ ___ ___ **End:** __/__/__ __:__

Laboratory Analyses:

Container	Preservative	Holding Time	Analysis
1 - 8 oz glass	4 Deg C	180 Days	1 Metals in Solids by ICP

Sample Comments:
(N/A)

812 N. Buckeye

Sample Collected By: RC

Sample Collection Field Sheet
US EPA Region 7
Kansas City, KS

ASR Number: 3156 **Sample Number:** 32 **QC Code:** __ **Matrix:** Solid **Tag ID:** 3156-32-__

Project ID: EMA78Q00 **Project Manager:** Eddie McGlasson
Project Desc: United Zinc No. 1 site sampling
City: Iola **State:** Kansas
Program: Superfund
Site Name: United Zinc No. 1 - **Site ID:** A78Q **Site OU:** 00

Location Desc: EPA #806 Cell #1

External Sample Number: _____

Expected Conc: (or Circle One: Low Medium High) **Date** **Time(24 hr)**

Latitude: ___ ___ ___ **Sample Collection: Start:** 10/29/06 15:03
Longitude: ___ ___ ___ **End:** __/__/__ __:__

Laboratory Analyses:

Container	Preservative	Holding Time	Analysis
1 - 8 oz glass	4 Deg C	180 Days	1 Metals in Solids by ICP

Sample Comments:
(N/A)

815 N Buckeye

Sample Collected By: RC

Sample Collection Field Sheet
US EPA Region 7
Kansas City, KS

ASR Number: 3156 **Sample Number:** 33 **QC Code:** __ **Matrix:** Solid **Tag ID:** 3156-33-__

Project ID: EMA78Q00 **Project Manager:** Eddie McGlasson
Project Desc: United Zinc No. 1 site sampling
City: Iola **State:** Kansas
Program: Superfund
Site Name: United Zinc No. 1 - **Site ID:** A78Q **Site OU:** 00

Location Desc: EPA# 787 Cell #1

External Sample Number: _____

Expected Conc: (or Circle One: Low Medium High) **Date** **Time(24 hr)**

Latitude: ___ ___ ___ **Sample Collection: Start:** 10/24/06 15:57
Longitude: ___ ___ ___ **End:** __/__/__ __:__

Laboratory Analyses:

Container	Preservative	Holding Time	Analysis
1 - 8 oz glass	4 Deg C	180 Days	1 Metals in Solids by ICP

Sample Comments:
(N/A)

401 N 3rd St.

Sample Collected By: RC

Sample Collection Field Sheet
US EPA Region 7
Kansas City, KS

ASR Number: 3156 **Sample Number:** 34 **QC Code:** __ **Matrix:** Solid **Tag ID:** 3156-34-__

Project ID: EMA78Q00 **Project Manager:** Eddie McGlasson
Project Desc: United Zinc No. 1 site sampling
City: Iola **State:** Kansas
Program: Superfund
Site Name: United Zinc No. 1 - **Site ID:** A78Q **Site OU:** 00

Location Desc: 786 C-1

External Sample Number: _____

Expected Conc: (or Circle One: Low Medium High) **Date** **Time(24 hr)**

Latitude: ___ ___ ___ **Sample Collection: Start:** 10/25/06 10:00
Longitude: ___ ___ ___ **End:** __/__/__ __:__

Laboratory Analyses:

Container	Preservative	Holding Time	Analysis
1 - 8 oz glass	4 Deg C	180 Days	1 Metals in Solids by ICP

Sample Comments:
(N/A) 915 N Jefferson

Sample Collected By: RC

Sample Collection Field Sheet
US EPA Region 7
Kansas City, KS

ASR Number: 3156 **Sample Number:** 35 **QC Code:** __ **Matrix:** Solid **Tag ID:** 3156-35-__

Project ID: EMA78Q00 **Project Manager:** Eddie McGlasson
Project Desc: United Zinc No. 1 site sampling
City: Iola **State:** Kansas
Program: Superfund
Site Name: United Zinc No. 1 - **Site ID:** A78Q **Site OU:** 00

Location Desc: #500 C2

External Sample Number: _____

Expected Conc: (or Circle One: Low Medium High) **Date** **Time(24 hr)**

Latitude: ___ ___ ___ **Sample Collection: Start:** 10/25/06 1825
Longitude: ___ ___ ___ **End:** __/__/__ __:__

Laboratory Analyses:

Container	Preservative	Holding Time	Analysis
1 - 8 oz glass	4 Deg C	180 Days	1 Metals in Solids by ICP

Sample Comments:
(N/A) 1315 E Douglas

Sample Collected By: RC

Sample Collection Field Sheet
US EPA Region 7
Kansas City, KS

ASR Number: 3156 **Sample Number:** 36 **QC Code:** __ **Matrix:** Solid **Tag ID:** 3156-36-__

Project ID: EMA78Q00 **Project Manager:** Eddie McGlasson
Project Desc: United Zinc No. 1 site sampling
City: Iola **State:** Kansas
Program: Superfund
Site Name: United Zinc No. 1 - **Site ID:** A78Q **Site OU:** 00

Location Desc: #509 C1

External Sample Number: _____

Expected Conc: (or Circle One: Low Medium High) **Date** **Time(24 hr)**

Latitude: ___ ___ ___ **Sample Collection: Start:** 10/25/06 16:27
Longitude: ___ ___ ___ **End:** __/__/__ __:__

Laboratory Analyses:

Container	Preservative	Holding Time	Analysis
1 - 8 oz glass	4 Deg C	180 Days	1 Metals in Solids by ICP

Sample Comments:
(N/A) 923 E Douglas

Sample Collected By: RC

Sample Collection Field Sheet
US EPA Region 7
Kansas City, KS

ASR Number: 3156 **Sample Number:** 37 **QC Code:** __ **Matrix:** Solid **Tag ID:** 3156-37-__

Project ID: EMA78Q00 **Project Manager:** Eddie McGlasson
Project Desc: United Zinc No. 1 site sampling
City: Iola **State:** Kansas
Program: Superfund
Site Name: United Zinc No. 1 - **Site ID:** A78Q **Site OU:** 00

Location Desc: 853 C-1

External Sample Number: _____

Expected Conc: (or Circle One: Low Medium High) **Date** **Time(24 hr)**

Latitude: ___ ___ ___ **Sample Collection: Start:** 10/26/06 11:15
Longitude: ___ ___ ___ **End:** __/__/__ __:__

Laboratory Analyses:

Container	Preservative	Holding Time	Analysis
1 - 8 oz glass	4 Deg C	180 Days	1 Metals in Solids by ICP

Sample Comments:
(N/A)

202 S. First

Sample Collected By: RC

CHAIN OF CUSTODY RECORD
ENVIRONMENTAL PROTECTION AGENCY REGION VII

ACTIVITY LEADER(Print)	NAME OF SURVEY OR ACTIVITY	DATE OF COLLECTION (DAY / MONTH / YEAR)	SHEET
Eddie McGlasson	United Zinc #1 Removal	30 10/11 06	1 of 1

CONTENTS OF SHIPMENT

SAMPLE NUMBER EM78Q00	TYPE OF CONTAINERS: CUBITAINER	BOTTLE (glass)	BOTTLE	BOTTLE	VOA SET (2 VIALS EA)	SAMPLED MEDIA: water	soil	sediment	dust	other	RECEIVING LABORATORY REMARKS/OTHER INFORMATION (condition of samples upon receipt, other sample numbers etc.)
	NUMBERS OF CONTAINERS PER SAMPLE NUMBER										
3157-1		1					X				
-2		1					X				
-3		1					X				
-4		1					X				
-5		1					X				
-6		1					X				
-7		1					X				
-8		1					X				
-9		1					X				
-10		1					X				
-11		1					X				
-12		1					X				
-13		1					X				
-14		1					X				
-15		1					X				
-16		1					X				
-17		1					X				
-18		1					X				
		Nothing More to Follow									

DESCRIPTION OF SHIPMENT

____ PIECE(S) CONSISTING OF ____ BOX(ES)

1 ICE CHEST(S) OTHER ____

MODE OF SHIPMENT

____ COMMERCIAL CARRIER: ____

____ COURIER

X SAMPLER CONVEYED

____ (SHIPPING DOCUMENT NUMBER)

PERSONNEL CUSTODY RECORD

RELINQUISHED BY (SAMPLER)	DATE	TIME	RECEIVED BY	REASON FOR CHANGE OF CUSTODY
☐ SEALED UNSEALED ☐			☐ SEALED UNSEALED ☐	
RELINQUISHED BY	DATE	TIME	RECEIVED BY	REASON FOR CHANGE OF CUSTODY
☐ SEALED UNSEALED ☐			☐ SEALED UNSEALED ☐	
RELINQUISHED BY	DATE	TIME	RECEIVED BY	REASON FOR CHANGE OF CUSTODY
☐ SEALED UNSEALED ☐			☐ SEALED UNSEALED ☐	

7-EPA-9262(Revised 5/85)

*U.S. GPO: 2002-756-917/40053

Sample Collection Field Sheet
US EPA Region 7
Kansas City, KS

ASR Number: 3157 **Sample Number:** 1 **QC Code:** __ **Matrix:** Solid **Tag ID:** 3157-1-__

Project ID: EMA78Q00 **Project Manager:** Eddie McGlasson
Project Desc: United Zinc No. 1 site sampling
City: Iola **State:** Kansas
Program: Superfund
Site Name: United Zinc No. 1 - **Site ID:** A78Q **Site OU:** 00

Location Desc: EPA 525C-4 d

External Sample Number: _____

Expected Conc: (or Circle One: Low Medium High) **Date** **Time(24 hr)**

Latitude: ___ ___ ___ **Sample Collection: Start:** 10/30/06 17:20
Longitude: ___ ___ ___ **End:** __/__/__ __:__

Laboratory Analyses:

Container	Preservative	Holding Time	Analysis
1 - 8 oz glass	4 Deg C	180 Days	1 Metals in Solids by ICP

Sample Comments:
(N/A)

716 East st.

Sample Collected By: RC

Sample Collection Field Sheet
US EPA Region 7
Kansas City, KS

ASR Number: 3157 **Sample Number:** 2 **QC Code:** __ **Matrix:** Solid **Tag ID:** 3157-2-__

Project ID: EMA78Q00 **Project Manager:** Eddie McGlasson
Project Desc: United Zinc No. 1 site sampling
City: Iola **State:** Kansas
Program: Superfund
Site Name: United Zinc No. 1 - **Site ID:** A78Q **Site OU:** 00

Location Desc: EPA 526 C #2

External Sample Number: _____

Expected Conc: (or Circle One: Low Medium High) **Date** **Time(24 hr)**

Latitude: ___ ___ ___ **Sample Collection: Start:** 10/30/06 19:30
Longitude: ___ ___ ___ **End:** __/__/__ __:__

Laboratory Analyses:

Container	Preservative	Holding Time	Analysis
1 - 8 oz glass	4 Deg C	180 Days	1 Metals in Solids by ICP

Sample Comments:
(N/A) 412 East 5th

Sample Collected By: RC

Sample Collection Field Sheet
US EPA Region 7
Kansas City, KS

ASR Number: 3157 **Sample Number:** 3 **QC Code:** __ **Matrix:** Solid **Tag ID:** 3157-3-__

Project ID: EMA78Q00 **Project Manager:** Eddie McGlasson
Project Desc: United Zinc No. 1 site sampling
City: Iola **State:** Kansas
Program: Superfund
Site Name: United Zinc No. 1 - **Site ID:** A78Q **Site OU:** 00

Location Desc: EPA 480 C #2

External Sample Number: _____

Expected Conc: (or Circle One: Low Medium High) **Date** **Time(24 hr)**

Latitude: ___ ___ ___ **Sample Collection: Start:** 10/3/06 09:00
Longitude: ___ ___ ___ **End:** __/__/__ __:__

Laboratory Analyses:

Container	Preservative	Holding Time	Analysis
1 - 8 oz glass	4 Deg C	180 Days	1 Metals in Solids by ICP

Sample Comments:
(N/A)

810 East St.

Sample Collected By: RC

Sample Collection Field Sheet
US EPA Region 7
Kansas City, KS

ASR Number: 3157 **Sample Number:** 4 **QC Code:** __ **Matrix:** Solid **Tag ID:** 3157-4-__

Project ID: EMA78Q00 **Project Manager:** Eddie McGlasson
Project Desc: United Zinc No. 1 site sampling
City: Iola **State:** Kansas
Program: Superfund
Site Name: United Zinc No. 1 - **Site ID:** A78Q **Site OU:** 00

Location Desc: EPA 544 C#1

External Sample Number: _____

Expected Conc: (or Circle One: Low Medium High) **Date** **Time(24 hr)**

Latitude: ___ ___ ___ **Sample Collection: Start:** 10/31/06 18:50
Longitude: ___ ___ ___ **End:** __/__/__ __:__

Laboratory Analyses:

Container	Preservative	Holding Time	Analysis
1 - 8 oz glass	4 Deg C	180 Days	1 Metals in Solids by ICP

Sample Comments:
(N/A)

1002 East 5f.

Sample Collected By: RC

Sample Collection Field Sheet
US EPA Region 7
Kansas City, KS

ASR Number: 3157 **Sample Number:** 5 **QC Code:** __ **Matrix:** Solid **Tag ID:** 3157-5-__

Project ID: EMA78Q00 **Project Manager:** Eddie McGlasson
Project Desc: United Zinc No. 1 site sampling
City: Iola **State:** Kansas
Program: Superfund
Site Name: United Zinc No. 1 - **Site ID:** A78Q **Site OU:** 00

Location Desc: EPA 877 C #1

External Sample Number: _____

Expected Conc: (or Circle One: Low Medium High) **Date** **Time(24 hr)**

Latitude: ___ ___ ___ **Sample Collection: Start:** 10/13/06 16:45
Longitude: ___ ___ ___ **End:** __/__/__ __:__

Laboratory Analyses:

Container	Preservative	Holding Time	Analysis
1 - 8 oz glass	4 Deg C	180 Days	1 Metals in Solids by ICP

Sample Comments:
(N/A)

124 E. Jackson,

Sample Collected By: RC

Sample Collection Field Sheet
US EPA Region 7
Kansas City, KS

ASR Number: 3157 **Sample Number:** 6 **QC Code:** __ **Matrix:** Solid **Tag ID:** 3157-6-__

Project ID: EMA78Q00 **Project Manager:** Eddie McGlasson
Project Desc: United Zinc No. 1 site sampling
City: Iola **State:** Kansas
Program: Superfund
Site Name: United Zinc No. 1 - **Site ID:** A78Q **Site OU:** 00

Location Desc: EPA 408 C #I

External Sample Number: _____

Expected Conc: (or Circle One: Low Medium High) **Date** **Time(24 hr)**

Latitude: ___ ___ ___ **Sample Collection: Start:** 10/31/06 08:57
Longitude: ___ ___ ___ **End:** __/__/__ __:__

Laboratory Analyses:

Container	Preservative	Holding Time	Analysis
1 - 8 oz glass	4 Deg C	180 Days	1 Metals in Solids by ICP

Sample Comments:
(N/A)

324 S. Oak

Sample Collected By: ~~RC~~ AH

Sample Collection Field Sheet
US EPA Region 7
Kansas City, KS

ASR Number: 3157 **Sample Number:** 7 **QC Code:** __ **Matrix:** Solid **Tag ID:** 3157-7-__

Project ID: EMA78Q00 **Project Manager:** Eddie McGlasson
Project Desc: United Zinc No. 1 site sampling
City: Iola **State:** Kansas
Program: Superfund
Site Name: United Zinc No. 1 - **Site ID:** A78Q **Site OU:** 00

Location Desc: EPA 883 C # 2

External Sample Number: _____

Expected Conc: (or Circle One: Low Medium High) **Date** **Time(24 hr)**

Latitude: ___ ___ ___ **Sample Collection: Start:** 11/1/06 09:30
Longitude: ___ ___ ___ **End:** __/__/__ __:__

Laboratory Analyses:

Container	Preservative	Holding Time	Analysis
1 - 8 oz glass	4 Deg C	180 Days	1 Metals in Solids by ICP

Sample Comments:
(N/A) 521 North St.

Sample Collected By: RC

Sample Collection Field Sheet
US EPA Region 7
Kansas City, KS

ASR Number: 3157 **Sample Number:** 8 **QC Code:** __ **Matrix:** Solid **Tag ID:** 3157-8-__

Project ID: EMA78Q00 **Project Manager:** Eddie McGlasson
Project Desc: United Zinc No. 1 site sampling
City: Iola **State:** Kansas
Program: Superfund
Site Name: United Zinc No. 1 - **Site ID:** A78Q **Site OU:** 00

Location Desc: EPA 844 C#2

External Sample Number: _____

Expected Conc: (or Circle One: Low Medium High) **Date** **Time(24 hr)**

Latitude: ___ ___ ___ **Sample Collection: Start:** 11/1/06 13:00
Longitude: ___ ___ ___ **End:** __/__/__ __:__

Laboratory Analyses:

Container	Preservative	Holding Time	Analysis
1 - 8 oz glass	4 Deg C	180 Days	1 Metals in Solids by ICP

Sample Comments:
(N/A)

402 S. Washington

Sample Collected By: RC

Sample Collection Field Sheet
US EPA Region 7
Kansas City, KS

ASR Number: 3157 **Sample Number:** 9 **QC Code:** __ **Matrix:** Solid **Tag ID:** 3157-9-__

Project ID: EMA78Q00 **Project Manager:** Eddie McGlasson
Project Desc: United Zinc No. 1 site sampling
City: Iola **State:** Kansas
Program: Superfund
Site Name: United Zinc No. 1 - **Site ID:** A78Q **Site OU:** 00

Location Desc: EPA 862 C#1

External Sample Number: _____

Expected Conc: (or Circle One: Low Medium High) **Date** **Time(24 hr)**

Latitude: __ __ __ **Sample Collection: Start:** 11/1/06 16:45
Longitude: __ __ __ **End:** __/__/__ __:__

Laboratory Analyses:

Container	Preservative	Holding Time	Analysis
1 - 8 oz glass	4 Deg C	180 Days	1 Metals in Solids by ICP

Sample Comments:
(N/A)

210 S. State

Sample Collected By: RC

Sample Collection Field Sheet
US EPA Region 7
Kansas City, KS

ASR Number: 3157 **Sample Number:** 10 **QC Code:** __ **Matrix:** Solid **Tag ID:** 3157-10-__

Project ID: EMA78Q00 **Project Manager:** Eddie McGlasson
Project Desc: United Zinc No. 1 site sampling
City: Iola **State:** Kansas
Program: Superfund
Site Name: United Zinc No. 1 - **Site ID:** A78Q **Site OU:** 00

Location Desc: EPA 833 c #1

External Sample Number: _____

Expected Conc: (or Circle One: Low Medium High) **Date** **Time(24 hr)**

Latitude: ___ ___ ___ **Sample Collection: Start:** 11/2/06 09:00
Longitude: ___ ___ ___ **End:** __/__/__ __:__

Laboratory Analyses:

Container	Preservative	Holding Time	Analysis
1 - 8 oz glass	4 Deg C	180 Days	1 Metals in Solids by ICP

Sample Comments:
(N/A) 302 S. Walnut

Sample Collected By: RC

Sample Collection Field Sheet
US EPA Region 7
Kansas City, KS

ASR Number: 3157 **Sample Number:** 11 **QC Code:** __ **Matrix:** Solid **Tag ID:** 3157-11-__

Project ID: EMA78Q00 **Project Manager:** Eddie McGlasson
Project Desc: United Zinc No. 1 site sampling
City: Iola **State:** Kansas
Program: Superfund
Site Name: United Zinc No. 1 - **Site ID:** A78Q **Site OU:** 00

Location Desc: EPA 792 C #3

External Sample Number: _____

Expected Conc: (or Circle One: Low Medium High) **Date** **Time(24 hr)**

Latitude: ___ ___ ___ **Sample Collection: Start:** 11/2/06 14:00
Longitude: ___ ___ ___ **End:** __/__/__ __:__

Laboratory Analyses:

Container	Preservative	Holding Time	Analysis
1 - 8 oz glass	4 Deg C	180 Days	1 Metals in Solids by ICP

Sample Comments:
(N/A) 523 N. Washington

Sample Collected By: ~~RC~~ AK

Sample Collection Field Sheet
US EPA Region 7
Kansas City, KS

ASR Number: 3157 **Sample Number:** 12 **QC Code:** __ **Matrix:** Solid **Tag ID:** 3157-12-__

Project ID: EMA78Q00 **Project Manager:** Eddie McGlasson
Project Desc: United Zinc No. 1 site sampling
City: Iola **State:** Kansas
Program: Superfund
Site Name: United Zinc No. 1 - **Site ID:** A78Q **Site OU:** 00

Location Desc: EPA 813 C #1

External Sample Number: _____

Expected Conc: (or Circle One: Low Medium High) **Date** **Time(24 hr)**

Latitude: ___ ___ ___ **Sample Collection: Start:** 11/2/06 6:00
Longitude: ___ ___ ___ **End:** __/__/__ __:__

Laboratory Analyses:

Container	Preservative	Holding Time	Analysis
1 - 8 oz glass	4 Deg C	180 Days	1 Metals in Solids by ICP

Sample Comments:
(N/A)

702 N. Walnut

Sample Collected By: RC

Sample Collection Field Sheet
US EPA Region 7
Kansas City, KS

ASR Number: 3157 **Sample Number:** 13 **QC Code:** __ **Matrix:** Solid **Tag ID:** 3157-13-__

Project ID: EMA78Q00 **Project Manager:** Eddie McGlasson
Project Desc: United Zinc No. 1 site sampling
City: Iola **State:** Kansas
Program: Superfund
Site Name: United Zinc No. 1 - **Site ID:** A78Q **Site OU:** 00

Location Desc: EPA 887 C #2

External Sample Number: _____

Expected Conc: (or Circle One: Low Medium High) **Date** **Time(24 hr)**

Latitude: ___ ___ ___ **Sample Collection: Start:** 11/3/06 11:10
Longitude: ___ ___ ___ **End:** __/__/__ __:__

Laboratory Analyses:

Container	Preservative	Holding Time	Analysis
1 - 8 oz glass	4 Deg C	180 Days	1 Metals in Solids by ICP

Sample Comments:
(N/A)

322 N. Walnut

Sample Collected By: RC

Sample Collection Field Sheet
US EPA Region 7
Kansas City, KS

ASR Number: 3157 **Sample Number:** 14 **QC Code:** __ **Matrix:** Solid **Tag ID:** 3157-14-__

Project ID: EMA78Q00 **Project Manager:** Eddie McGlasson
Project Desc: United Zinc No. 1 site sampling
City: Iola **State:** Kansas
Program: Superfund
Site Name: United Zinc No. 1 - **Site ID:** A78Q **Site OU:** 00

Location Desc: EPA # 6006 Cell #1

External Sample Number: _____

Expected Conc: (or Circle One: Low Medium High) **Date** **Time(24 hr)**

Latitude: ___ ___ ___ **Sample Collection: Start:** 11/6/06 14:40
Longitude: ___ ___ ___ **End:** __/__/__ __:__

Laboratory Analyses:

Container	Preservative	Holding Time	Analysis
1 - 8 oz glass	4 Deg C	180 Days	1 Metals in Solids by ICP

Sample Comments:
(N/A) 904 N. Chestnut

Sample Collected By: RC

Sample Collection Field Sheet
US EPA Region 7
Kansas City, KS

ASR Number: 3157 **Sample Number:** 15 **QC Code:** __ **Matrix:** Solid **Tag ID:** 3157-15-__

Project ID: EMA78Q00 **Project Manager:** Eddie McGlasson
Project Desc: United Zinc No. 1 site sampling
City: Iola **State:** Kansas
Program: Superfund
Site Name: United Zinc No. 1 - **Site ID:** A78Q **Site OU:** 00

Location Desc: EPA # Cell Cell #3

External Sample Number: _____

Expected Conc: (or Circle One: Low Medium High) **Date** **Time(24 hr)**

Latitude: ___.___ ___ **Sample Collection: Start:** 11/16/06 16:30
Longitude: ___ ___ ___ **End:** __/__/__ __:__

Laboratory Analyses:

Container	Preservative	Holding Time	Analysis
1 - 8 oz glass	4 Deg C	180 Days	1 Metals in Solids by ICP

Sample Comments:
(N/A)

3 W Douglas

Sample Collected By: RC

Sample Collection Field Sheet
US EPA Region 7
Kansas City, KS

ASR Number: 3157 **Sample Number:** 16 **QC Code:** __ **Matrix:** Solid **Tag ID:** 3157-16-__

Project ID: EMA78Q00 **Project Manager:** Eddie McGlasson
Project Desc: United Zinc No. 1 site sampling
City: Iola **State:** Kansas
Program: Superfund
Site Name: United Zinc No. 1 - **Site ID:** A78Q **Site OU:** 00

Location Desc: EPA 668 C #2

External Sample Number: _____

Expected Conc: (or Circle One: Low Medium High) **Date** **Time(24 hr)**

Latitude: ___ ___ ___ **Sample Collection: Start:** 11/7/06 13:15
Longitude: ___ ___ ___ **End:** __/__/__ __:__

Laboratory Analyses:

Container	Preservative	Holding Time	Analysis
1 - 8 oz glass	4 Deg C	180 Days	1 Metals in Solids by ICP

Sample Comments:
(N/A)

217 W. Jackson.

Sample Collected By: ~~RC~~ QD

Sample Collection Field Sheet
US EPA Region 7
Kansas City, KS

ASR Number: 3157 **Sample Number:** 17 **QC Code:** __ **Matrix:** Solid **Tag ID:** 3157-17-__

Project ID: EMA78Q00 **Project Manager:** Eddie McGlasson
Project Desc: United Zinc No. 1 site sampling
City: Iola **State:** Kansas
Program: Superfund
Site Name: United Zinc No. 1 - **Site ID:** A78Q **Site OU:** 00

Location Desc: EPA 907 C #1

External Sample Number: _____

Expected Conc: (or Circle One: Low Medium High) **Date** **Time(24 hr)**

Latitude: ___ ___ ___ **Sample Collection: Start:** 11/8/06 11:00
Longitude: ___ ___ ___ **End:** __/__/__ __:__

Laboratory Analyses:

Container	Preservative	Holding Time	Analysis
1 - 8 oz glass	4 Deg C	180 Days	1 Metals in Solids by ICP

Sample Comments:
(N/A) 804 N. Washington

Sample Collected By: ~~RE~~ QD

Sample Collection Field Sheet
US EPA Region 7
Kansas City, KS

ASR Number: 3157 **Sample Number:** 18 **QC Code:** __ **Matrix:** Solid **Tag ID:** 3157-18-__

Project ID: EMA78Q00 **Project Manager:** Eddie McGlasson
Project Desc: United Zinc No. 1 site sampling
City: Iola **State:** Kansas
Program: Superfund
Site Name: United Zinc No. 1 - **Site ID:** A78Q **Site OU:** 00

Location Desc: EPA 919 C #3

External Sample Number: _____

Expected Conc: (or Circle One: Low Medium High) **Date** **Time(24 hr)**

Latitude: ___ ___ ___ **Sample Collection: Start:** 11/9/06 11:00
Longitude: ___ ___ ___ **End:** __/__/__ __:__

Laboratory Analyses:

Container	Preservative	Holding Time	Analysis
1 - 8 oz glass	4 Deg C	180 Days	1 Metals in Solids by ICP

Sample Comments:
(N/A) 624 N. Washington.

Sample Collected By: ~~RE~~ QD

CHAIN OF CUSTODY RECORD
ENVIRONMENTAL PROTECTION AGENCY REGION VII

ACTIVITY LEADER(Print)	NAME OF SURVEY OR ACTIVITY	DATE OF COLLECTION (DAY / MONTH / YEAR)	SHEET
Eddie McGlasson	United Zinc #1	6-29-06	1 of 1

CONTENTS OF SHIPMENT

SAMPLE NUMBER EMA78Q00	TYPE OF CONTAINERS: CUBITAINER	BOTTLE (Glass)	BOTTLE	BOTTLE	VOA SET (2 VIALS EA)	SAMPLED MEDIA: water	soil	sediment	dust	other	RECEIVING LABORATORY REMARKS/OTHER INFORMATION (condition of samples upon receipt, other sample numbers etc.)
	NUMBERS OF CONTAINERS PER SAMPLE NUMBER										
3158-1		✓					X				
2		✓					X				
3		✓					X				
4		✓					X				
5		✓					X				
6		✓					X				
7		✓					X				
8		✓					X				
9		✓					X				
10		✓					X				
11		✓					X				

Nothing More to Follow

DESCRIPTION OF SHIPMENT

_____ PIECE(S) CONSISTING OF 1 BOX(ES)

_____ ICE CHEST(S). OTHER _____

MODE OF SHIPMENT

_____ COMMERCIAL CARRIER: _____

_____ COURIER

X SAMPLER CONVEYED

_____ (SHIPPING DOCUMENT NUMBER)

PERSONNEL CUSTODY RECORD

RELINQUISHED BY (SAMPLER)	DATE	TIME	RECEIVED BY	REASON FOR CHANGE OF CUSTODY
SEALED UNSEALED X			SEALED UNSEALED	
RELINQUISHED BY	DATE	TIME	RECEIVED BY	REASON FOR CHANGE OF CUSTODY
SEALED UNSEALED			SEALED UNSEALED	
RELINQUISHED BY	DATE	TIME	RECEIVED BY	REASON FOR CHANGE OF CUSTODY
SEALED UNSEALED			SEALED UNSEALED	

7-EPA-9262(Revised 5/85)

*U.S. GPO: 2002-756-917/40053

Sample Collection Field Sheet
US EPA Region 7
Kansas City, KS

ASR Number: 3158 **Sample Number:** 1 **QC Code:** __ **Matrix:** Solid **Tag ID:** 3158-1-__

Project ID: EMA78Q00 **Project Manager:** Eddie McGlasson
Project Desc: United Zinc No. 1 site sampling
City: Iola **State:** Kansas
Program: Superfund
Site Name: United Zinc No. 1 - **Site ID:** A78Q **Site OU:** 00

Location Desc: EPA # 927 Cell #2

External Sample Number: _____

Expected Conc: (or Circle One: Low Medium High) **Date** **Time(24 hr)**

Latitude: ___ ___ ___ **Sample Collection: Start:** 11/13/06 14:00
Longitude: ___ ___ ___ **End:** __/__/__ __:__

Laboratory Analyses:

Container	Preservative	Holding Time	Analysis
1 - 8 oz glass	4 Deg C	180 Days	1 Metals in Solids by ICP

Sample Comments:
(N/A) 102 E. Buchanan

Sample Collected By: ~~BC~~ JJ

Sample Collection Field Sheet
US EPA Region 7
Kansas City, KS

ASR Number: 3158 **Sample Number:** 2 **QC Code:** __ **Matrix:** Solid **Tag ID:** 3158-2-__

Project ID: EMA78Q00 **Project Manager:** Eddie McGlasson
Project Desc: United Zinc No. 1 site sampling
City: Iola **State:** Kansas
Program: Superfund
Site Name: United Zinc No. 1 - **Site ID:** A78Q **Site OU:** 00

Location Desc: EPA #931 Cell #2

External Sample Number: _____

Expected Conc: (or Circle One: Low Medium High) **Date** **Time(24 hr)**

Latitude: ___ ___ ___ **Sample Collection: Start:** 11/15/06 14:30
Longitude: ___ ___ ___ **End:** __/__/__ __:__

Laboratory Analyses:

Container	Preservative	Holding Time	Analysis
1 - 8 oz glass	4 Deg C	180 Days	1 Metals in Solids by ICP

Sample Comments: 208 S. Cottonwood
(N/A)

Sample Collected By: ~~RE~~ JJ

Sample Collection Field Sheet
US EPA Region 7
Kansas City, KS

ASR Number: 3158 **Sample Number:** 3 **QC Code:** __ **Matrix:** Solid **Tag ID:** 3158-3-__

Project ID: EMA78Q00 **Project Manager:** Eddie McGlasson
Project Desc: United Zinc No. 1 site sampling
City: Iola **State:** Kansas
Program: Superfund
Site Name: United Zinc No. 1 - **Site ID:** A78Q **Site OU:** 00

Location Desc: EPA # 965 Cell # 1

External Sample Number: _____

Expected Conc: (or Circle One: Low Medium High) **Date** **Time(24 hr)**

Latitude: ___ ___ ___ **Sample Collection: Start:** 4/17/06 09:30
Longitude: ___ ___ ___ **End:** __/__/__ __:__

Laboratory Analyses:

Container	Preservative	Holding Time	Analysis
1 - 8 oz glass	4 Deg C	180 Days	1 Metals in Solids by ICP

Sample Comments: 318 N Colborn
(N/A)

Sample Collected By: RC

Sample Collection Field Sheet
US EPA Region 7
Kansas City, KS

ASR Number: 3158 **Sample Number:** 4 **QC Code:** __ **Matrix:** Solid **Tag ID:** 3158-4-__

Project ID: EMA78Q00 **Project Manager:** Eddie McGlasson
Project Desc: United Zinc No. 1 site sampling
City: Iola **State:** Kansas
Program: Superfund
Site Name: United Zinc No. 1 - **Site ID:** A78Q **Site OU:** 00

Location Desc: EPA #982 Cell #1

External Sample Number: _____

Expected Conc: (or Circle One: Low Medium High) **Date** **Time(24 hr)**

Latitude: ___ ___ ___ **Sample Collection: Start:** 11/21/06 11:00
Longitude: ___ ___ ___ **End:** __/__/__ __:__

Laboratory Analyses:

Container	*Preservative*	*Holding Time*	*Analysis*
1 - 8 oz glass	4 Deg C	180 Days	1 Metals in Solids by ICP

Sample Comments:
(N/A)

215 N 3rd

Sample Collected By: ~~BS~~ AH

Sample Collection Field Sheet
US EPA Region 7
Kansas City, KS

ASR Number: 3158 **Sample Number:** 5 **QC Code:** __ **Matrix:** Solid **Tag ID:** 3158-5-__

Project ID: EMA78Q00 **Project Manager:** Eddie McGlasson
Project Desc: United Zinc No. 1 site sampling
City: Iola **State:** Kansas
Program: Superfund
Site Name: United Zinc No. 1 - **Site ID:** A78Q **Site OU:** 00

Location Desc: EPA # 975 Cell #2

External Sample Number: _____

Expected Conc: (or Circle One: Low Medium High) **Date** **Time(24 hr)**

Latitude: ___ ___ ___ **Sample Collection: Start:** __/__/__ __:__
Longitude: ___ ___ ___ **End:** __/__/__ __:__

Laboratory Analyses:

Container	Preservative	Holding Time	Analysis
1 - 8 oz glass	4 Deg C	180 Days	1 Metals in Solids by ICP

Sample Comments:
(N/A)

414 N Jefferson

Sample Collected By: ~~RE~~ AH

Sample Collection Field Sheet
US EPA Region 7
Kansas City, KS

ASR Number: 3158 **Sample Number:** 6 **QC Code:** __ **Matrix:** Solid **Tag ID:** 3158-6-__

Project ID: EMA78Q00 **Project Manager:** Eddie McGlasson
Project Desc: United Zinc No. 1 site sampling
City: Iola **State:** Kansas
Program: Superfund
Site Name: United Zinc No. 1 - **Site ID:** A78Q **Site OU:** 00

Location Desc: EPA 950 C # 2

External Sample Number: _____

Expected Conc: (or Circle One: Low Medium High) **Date** **Time(24 hr)**

Latitude: ___ ___ ___ **Sample Collection: Start:** 11/28/06 14:33
Longitude: ___ ___ ___ **End:** __/__/__ __:__

Laboratory Analyses:

Container	Preservative	Holding Time	Analysis
1 - 8 oz glass	4 Deg C	180 Days	1 Metals in Solids by ICP

Sample Comments:
(N/A)

115 S. 3rd

Sample Collected By: ~~RE~~ AH

Sample Collection Field Sheet
US EPA Region 7
Kansas City, KS

ASR Number: 3158 **Sample Number:** 7 **QC Code:** __ **Matrix:** Solid **Tag ID:** 3158-7-__

Project ID: EMA78Q00 **Project Manager:** Eddie McGlasson
Project Desc: United Zinc No. 1 site sampling
City: Iola **State:** Kansas
Program: Superfund
Site Name: United Zinc No. 1 - **Site ID:** A78Q **Site OU:** 00

Location Desc: EPA 962 C #3

External Sample Number: _____

Expected Conc: (or Circle One: Low Medium High) **Date** **Time(24 hr)**

Latitude: ___ ___ ___ **Sample Collection: Start:** 4/28/06 11:11
Longitude: ___ ___ ___ **End:** __/__/__ __:__

Laboratory Analyses:

Container	Preservative	Holding Time	Analysis
1 - 8 oz glass	4 Deg C	180 Days	1 Metals in Solids by ICP

Sample Comments:
(N/A)

516 S. Walnut

Sample Collected By: RC/ [illegible]

Sample Collection Field Sheet
US EPA Region 7
Kansas City, KS

ASR Number: 3158 **Sample Number:** 8 **QC Code:** __ **Matrix:** Solid **Tag ID:** 3158-8-__

Project ID: EMA78Q00 **Project Manager:** Eddie McGlasson
Project Desc: United Zinc No. 1 site sampling
City: Iola **State:** Kansas
Program: Superfund
Site Name: United Zinc No. 1 - **Site ID:** A78Q **Site OU:** 00

Location Desc: EPA 968 C #5

External Sample Number: _____

Expected Conc: (or Circle One: Low Medium High) **Date** **Time(24 hr)**

Latitude: ___ ___ ___ **Sample Collection: Start:** 11/27/06 1530
Longitude: ___ ___ ___ **End:** __/__/__ __:__

Laboratory Analyses:

Container	Preservative	Holding Time	Analysis
1 - 8 oz glass	4 Deg C	180 Days	1 Metals In Solids by ICP

Sample Comments:
(N/A) 311 N. Elm

Sample Collected By: ~~RC~~ JJ

Sample Collection Field Sheet
US EPA Region 7
Kansas City, KS

ASR Number: 3158 **Sample Number:** 9 **QC Code:** __ **Matrix:** Solid **Tag ID:** 3158-9-__

Project ID: EMA78Q00 **Project Manager:** Eddie McGlasson
Project Desc: United Zinc No. 1 site sampling
City: Iola **State:** Kansas
Program: Superfund
Site Name: United Zinc No. 1 - **Site ID:** A78Q **Site OU:** 00

Location Desc: EPA 957 c#3

External Sample Number: _____

Expected Conc: (or Circle One: Low Medium High) **Date** **Time(24 hr)**

Latitude: ___ ___ ___ **Sample Collection: Start:** 11/28/04 10:00
Longitude: ___ ___ ___ **End:** __/__/__ __:__

Laboratory Analyses:

Container	Preservative	Holding Time	Analysis
1 - 8 oz glass	4 Deg C	180 Days	1 Metals in Solids by ICP

Sample Comments:
(N/A) 420 N. Elm

Sample Collected By: ~~RC~~ SS

Sample Collection Field Sheet
US EPA Region 7
Kansas City, KS

ASR Number: 3158 **Sample Number:** 10 **QC Code:** __ **Matrix:** Solid **Tag ID:** 3158-10-__

Project ID: EMA78Q00 **Project Manager:** Eddie McGlasson
Project Desc: United Zinc No. 1 site sampling
City: Iola **State:** Kansas
Program: Superfund
Site Name: United Zinc No. 1 - **Site ID:** A78Q **Site OU:** 00

Location Desc: EPA 958 C # 2

External Sample Number: _____

Expected Conc: (or Circle One: Low Medium High) **Date** **Time(24 hr)**

Latitude: ___ ___ ___ **Sample Collection: Start:** 11/28/06 10:45
Longitude: ___ ___ ___ **End:** __/__/__ __:__

Laboratory Analyses:

Container	Preservative	Holding Time	Analysis
1 - 8 oz glass	4 Deg C	180 Days	1 Metals in Solids by ICP

Sample Comments:
(N/A)

512 N. Elm

Sample Collected By: BE

Sample Collection Field Sheet
US EPA Region 7
Kansas City, KS

ASR Number: 3158 **Sample Number:** 11 **QC Code:** __ **Matrix:** Solid **Tag ID:** 3158-11-__

Project ID: EMA78Q00 **Project Manager:** Eddie McGlasson
Project Desc: United Zinc No. 1 site sampling
City: Iola **State:** Kansas
Program: Superfund
Site Name: United Zinc No. 1 - **Site ID:** A78Q **Site OU:** 00

Location Desc: EPA 998 C #1

External Sample Number: _____

Expected Conc: (or Circle One: Low Medium High) **Date** **Time(24 hr)**

Latitude: ___ ___ ___ **Sample Collection: Start:** 11/29/06 10:00
Longitude: ___ ___ ___ **End:** __/__/__ __:__

Laboratory Analyses:

Container	Preservative	Holding Time	Analysis
1 - 8 oz glass	4 Deg C	180 Days	1 Metals in Solids by ICP

Sample Comments:
(N/A)

119 W. Vine

Sample Collected By: ~~RC~~ AH

APPENDIX D

ANALYTICAL RESULTS

United States Environmental Protection Agency
Region 7
901 N. 5th Street
Kansas City, KS 66101

Date: 08/29/2006

Subject: Transmittal of Sample Analysis Results for ASR #: 3151

Project ID: EMA78Q00

Project Description: United Zinc No. 1 site sampling

From: Dale I. Bates, Director
Regional Laboratory, Environmental Services Division

To: Eddie McGlasson
SUPR/ER&R

Enclosed are the analytical data for the above-referenced Analytical Services Request (ASR) and Project. The Regional Laboratory has reviewed and verified the results in accordance with procedures described in our Quality Manual (QM). In addition to all of the analytical results, this transmittal contains pertinent information that may have influenced the reported results and documents any deviations from the established requirements of the QM.

Please contact us within 14 days of receipt of this package if you determine there is a need for any changes. Please complete the enclosed Customer Satisfaction Survey and Data Disposition/Sample Release memo for this ASR as soon as possible. The process of disposing of the samples for this ASR will be initiated 30 days from the date of this transmittal unless an alternate release date is specified on the Data Disposition/Sample Release memo.

If you have any questions or concerns relating to this data package, contact our customer service line at 913-551-5295.

Enclosures

cc: Analytical Data File.

Project Manager: Eddie McGlasson **Org:** SUPR/ER&R **Phone:** 913-551-7756
Project ID: EMA78Q00
Project Desc: United Zinc No. 1 site sampling
Location: Iola **State:** Kansas **Program:** Superfund
Site Name: United Zinc No. 1 - **Site ID:** A78Q **Site OU:** 00
Purpose: Site Characterization **GPRA PRC:** 302DC6C

Explanation of Codes, Units and Qualifiers used on this report

Sample QC Codes: QC Codes identify the type of sample for quality control purpose.

__ = Field Sample

Units: Specific units in which results are reported.

% = Percent
mg/kg = Milligrams per Kilogram

Data Qualifiers: Specific codes used in conjunction with data values to provide additional information on the quality of reported results, or used to explain the absence of a specific value.

(Blank)= Values have been reviewed and found acceptable for use.
U = The analyte was not detected at or above the reporting limit.

ASR Number: 3151 **Sample Information Summary** **08/29/2006**

Project ID: EMA78Q00 **Project Desc:** United Zinc No. 1 site sampling

Sample No	QC Code	Matrix	Location Description	External Sample No	Start Date	Start Time	End Date	End Time	Receipt Date
1 -	__	Solid	EPA #270, Cell #2 (520 South Sycamore)		08/15/2006	10:10			08/17/2006
2 -	__	Solid	EPA #64, Cell #1 (910 North Walnut)		08/08/2006	10:05			08/17/2006
3 -	__	Solid	EPA #102, Cell #2 (416 East Jackson)		08/08/2006	09:15			08/17/2006
4 -	__	Solid	EPA #76, Cell #3 (812 North Walnut)		08/08/2006	09:53			08/17/2006
5 -	__	Solid	EPA #183, Cell #1 (402 South Sycamore)		08/08/2006	08:45			08/17/2006
6 -	__	Solid	EPA #261, Cell #1 (507 South Jefferson)		08/09/2006	10:45			08/17/2006
7 -	__	Solid	EPA #266, Cell #1 (415 South Sycamore)		08/09/2006	14:50			08/17/2006
8 -	__	Solid	EPA #260, Cell #1 (615 South Jefferson)		08/09/2006	10:00			08/17/2006
9 -	__	Solid	EPA #268, Cell #2 (502 South Sycamore)		08/09/2006	16:40			08/17/2006
10 -	__	Solid	EPA #262, Cell #4 (420 South Jefferson)		08/09/2006	11:30			08/17/2006
11 -	__	Solid	EPA #2 (204 South Kentucky) - Post Ex.		08/16/2006	08:10			08/17/2006
12 -	__	Solid	Backfill sample		08/16/2006	07:45			08/17/2006

Analysis	Comments About Results For This Analysis

1 Metals in Solids by ICP

Lab: Region 7 EPA Laboratory - Kansas City, Ks.

Method: EPA Region 7 RLAB Method 3122.3B

Samples: 1-__ 2-__ 3-__ 4-__ 5-__ 6-__ 7-__
8-__ 9-__ 10-__ 11-__ 12-__

Comments:
(N/A)

1 Percent Solid

Lab: Region 7 EPA Laboratory - Kansas City, Ks.

Method: EPA Region 7 RLAB Method 3142.9D

Samples: 1-__ 2-__ 3-__ 4-__ 5-__ 6-__ 7-__
8-__ 9-__ 10-__ 11-__ 12-__

Comments:
(N/A)

ASR Number: 3151 **RLAB Approved Sample Analysis Results** **08/29/2006**

Project ID: EMA78Q00 **Project Desc:** United Zinc No. 1 site sampling

Analysis/ Analyte	Units	1-__	2-__	3-__	4-__
1 Metals in Solids by ICP					
Arsenic	mg/kg	10.1	12.3	11.7	5.91
Barium	mg/kg	182	130	144	121
Cadmium	mg/kg	10.6	10.6	9.85	11.0
Lead	mg/kg	552	907	631	817
Zinc	mg/kg	1160	1140	1250	1130
1 Percent Solid					
Solids, percent	%	78.7	94.1	85.9	94.0

ASR Number: 3151 **RLAB Approved Sample Analysis Results** **08/29/2006**

Project ID: EMA78Q00 **Project Desc:** United Zinc No. 1 site sampling

Analysis/ Analyte	Units	5-__	6-__	7-__	8-__
1 Metals in Solids by ICP					
Arsenic	mg/kg	16.8	14.4	14.3	10.5
Barium	mg/kg	251	143	177	132
Cadmium	mg/kg	10.3	9.16	11.0	9.19
Lead	mg/kg	1440	805	1660	290
Zinc	mg/kg	1140	980	2400	737
1 Percent Solid					
Solids, percent	%	90.2	89.3	95.5	91.8

ASR Number: 3151 **RLAB Approved Sample Analysis Results** **08/29/2006**

Project ID: EMA78Q00 **Project Desc:** United Zinc No. 1 site sampling

Analysis/ Analyte	Units	9-__	10-__	11-__	12-__
1 Metals in Solids by ICP					
Arsenic	mg/kg	9.05	6.38	5 U	6.79
Barium	mg/kg	114	308	190	149
Cadmium	mg/kg	8.93	8.04	6.86	10.2
Lead	mg/kg	647	396	111	58.8
Zinc	mg/kg	1280	772	307	139
1 Percent Solid					
Solids, percent	%	95.0	91.3	82.5	85.5

United States Environmental Protection Agency
Region VII
901 N. 5th Street
Kansas City, KS 66101

Date: __/__/____

Subject: Data Disposition/Sample Release for ASR #: 3151

Project ID: EMA78Q00

Project Description: United Zinc No. 1 site sampling

From: Eddie McGlasson
SUPR/ER&R

To: Kaye Dollmann
ENSV/RLAB/CATS

I have received and reviewed the Transmittal of Sample Analysis Results for the above-referenced Analytical Services Request(ASR) and have indicated my findings below by checking one of the boxes for Data Disposition.

☐ "RELEASED" - Read-only to all Region 7 employees and contractors that have R7LIMS "Customer" account.

☐ "Project Manager Accessible" - Available on the LAN in R7LIMS for my use only.

☐ "Archived" - THIS DATA IS OF A SENSITIVE NATURE. Any future reports must be requested through the laboratory.

I have determined that the samples need to be held until _____, after which time they will be disposed of in accordance with applicable regulations. I understand that if I do not specify a "hold until" date, the process for proper disposal of the samples will be initiated 30 days after the date on the data transmittal.

United States Environmental Protection Agency
Region 7
901 N. 5th Street
Kansas City, KS 66101

Date: 09/20/2006

Subject: Transmittal of Sample Analysis Results for ASR #: 3152

Project ID: EMA78Q00

Project Description: United Zinc No. 1 site sampling

From: Dale I. Bates, Director
Regional Laboratory, Environmental Services Division

To: Eddie McGlasson
SUPR/ER&R

Enclosed are the analytical data for the above-referenced Analytical Services Request (ASR) and Project. The Regional Laboratory has reviewed and verified the results in accordance with procedures described in our Quality Manual (QM). In addition to all of the analytical results, this transmittal contains pertinent information that may have influenced the reported results and documents any deviations from the established requirements of the QM.

Please contact us within 14 days of receipt of this package if you determine there is a need for any changes. Please complete the enclosed Customer Satisfaction Survey and Data Disposition/Sample Release memo for this ASR as soon as possible. The process of disposing of the samples for this ASR will be initiated 30 days from the date of this transmittal unless an alternate release date is specified on the Data Disposition/Sample Release memo.

If you have any questions or concerns relating to this data package, contact our customer service line at 913-551-5295.

Enclosures

cc: Analytical Data File.

Project Manager: Eddie McGlasson **Org:** SUPR/ER&R **Phone:** 913-551-7756
Project ID: EMA78Q00
Project Desc: United Zinc No. 1 site sampling
Location: Iola **State:** Kansas **Program:** Superfund
Site Name: United Zinc No. 1 - **Site ID:** A78Q **Site OU:** 00
Purpose: Site Characterization **GPRA PRC:** 302DC6C

Explanation of Codes, Units and Qualifiers used on this report

Sample QC Codes: QC Codes identify the type of sample for quality control purpose.

__ = Field Sample

Units: Specific units in which results are reported.

mg/kg = Milligrams per Kilogram

Data Qualifiers: Specific codes used in conjunction with data values to provide additional information on the quality of reported results, or used to explain the absence of a specific value.

(Blank)= Values have been reviewed and found acceptable for use.
J = The identification of the analyte is acceptable; the reported value is an estimate.
U = The analyte was not detected at or above the reporting limit.

ASR Number: 3152 **Sample Information Summary** **09/20/2006**

Project ID: EMA78Q00 **Project Desc:** United Zinc No. 1 site sampling

Sample No	QC Code	Matrix	Location Description	External Sample No	Start Date	Start Time	End Date	End Time	Receipt Date
1 -	__	Solid	EPA 254, Cell #1 (326 South 2nd Street)		08/19/2006	10:00			09/05/2006
2 -	__	Solid	EPA 285, Cell #2 (517 South Sycamore)		08/21/2006	15:35			09/05/2006
3 -	__	Solid	EPA 298, Cell #1 (319 South Sycamore)		08/22/2006	09:30			09/05/2006
4 -	__	Solid	REPA 295, Cell #1 (307 South Sycamore)		08/22/2006	10:00			09/05/2006
5 -	__	Solid	EPA 274, Cell #2 (623 South Sycamore)		08/16/2006	14:10			09/05/2006
6 -	__	Solid	EPA 3, Cell #7 (300 South Jefferson)		08/16/2006	11:50			09/05/2006
7 -	__	Solid	EPA 297, Cell #1 (224 South Jefferson)		08/23/2006	15:10			09/05/2006
8 -	__	Solid	EPA 299, Cell #2 (309 East Street)		08/24/2006	11:25			09/05/2006
9 -	__	Solid	EPA 49, Cell #2 (801 East Jackson)		08/24/2006	14:00			09/05/2006
10 -	__	Solid	EPA 287, Cell #1 (310 South Buckeye)		08/25/2006	10:22			09/05/2006
11 -	__	Solid	EPA 281, Cell #1 (401 South Buckeye)		08/28/2006	14:00			09/05/2006
12 -	__	Solid	EPA 328, Cell #4 (102 North Buckeye)		08/29/2006	14:00			09/05/2006
13 -	__	Solid	EPA 334, Cell #1 (210 South Cottonwood)		08/29/2006	15:45			09/05/2006
14 -	__	Solid	EPA 325, Cell #1 (316 South Cottonwood)		08/30/2006	10:45			09/05/2006
15 -	__	Solid	EPA 326, Cell #3 (322 South Cottonwood)		08/30/2006	11:30			09/05/2006
16 -	__	Solid	EPA 294, Cell #1 (415 South Cottonwood)		08/30/2006	13:45			09/05/2006
17 -	__	Solid	EPA 309, Cell #2 (420 South Cottonwood)		08/30/2006	14:45			09/05/2006
18 -	__	Solid	EPA 340, Cell #1 (501 East Madison)		08/30/2006	17:15			09/05/2006
19 -	__	Solid	EPA 314, Cell #3 (502 South Cottonwood)		08/31/2006	10:10			09/05/2006
20 -	__	Solid	EPA 315, Cell #1 (622 South Cottonwood)		08/31/2006	13:15			09/05/2006

Analysis	Comments About Results For This Analysis

1 Metals in Solids by ICP

Lab: Contract Lab Program (Out-Source)

Method: CLP Statement of Work

Samples:						
1-__	2-__	3-__	4-__	5-__	6-__	7-__
8-__	9-__	10-__	11-__	12-__	13-__	14-__
15-__	16-__	17-__	18-__	19-__	20-__	

Comments:

Slight arsenic contamination was found in the calibration blanks. Only samples containing this analyte at a level greater than ten times the contamination level of the blank are reported without being qualified. All samples that contained this analyte but at a level less than ten times the contamination in the blank have the result U-coded indicating that the reporting limit has been raised to the level found in the sample. Samples affected were: arsenic in -9 through -12, -15, -16, -18, and -20.

Cadmium in samples -1 through -3, -5, -8 through -12, -15, -16, -18, and -20 was J-coded. Positive results were J-coded due to negative recoveries of this analyte in the interference check samples (ICS) which was not present in the ICS solution but whose absolute value was greater than the method detection limit (MDL), therefore, a possibility of false negatives exists. The actual reporting limits may be higher than the reported values.

Cadmium was J-coded in samples -1 through -20. Although the analyte in question has been positively identified in the sample, the quantitation is an estimate (J-coded) due to high recovery of this analyte in the laboratory matrix spike. The actual concentration for this analyte may be lower than the reported value.

ASR Number: 3152 **RLAB Approved Sample Analysis Results** **09/20/2006**

Project ID: EMA78Q00 **Project Desc:** United Zinc No. 1 site sampling

Analysis/ Analyte	**Units**	**1-__**	**2-__**	**3-__**	**4-__**
1 Metals in Solids by ICP					
Arsenic	mg/kg	13.2	15.2	16.6	26.1
Barium	mg/kg	141	194	219	212
Cadmium	mg/kg	4.68 J	5.72 J	5.85 J	9.67 J
Lead	mg/kg	946	991	782	1200
Zinc	mg/kg	1610	1420	1580	3180

ASR Number: 3152 **RLAB Approved Sample Analysis Results** **09/20/2006**

Project ID: EMA78Q00 **Project Desc:** United Zinc No. 1 site sampling

Analysis/ Analyte	Units	5-__	6-__	7-__	8-__
1 Metals in Solids by ICP					
Arsenic	mg/kg	90.6	33.8	16.4	15.4
Barium	mg/kg	213	221	262	199
Cadmium	mg/kg	4.18 J	6.38 J	8.39 J	5.62 J
Lead	mg/kg	1640	838	1140	1130
Zinc	mg/kg	1770	1720	2420	1920

ASR Number: 3152 **RLAB Approved Sample Analysis Results** **09/20/2006**

Project ID: EMA78Q00 **Project Desc:** United Zinc No. 1 site sampling

Analysis/ Analyte	Units	9-__	10-__	11-__	12-__
1 Metals in Solids by ICP					
Arsenic	mg/kg	7.40 U	8.54 U	8.54 U	8.22 U
Barium	mg/kg	186	147	166	376
Cadmium	mg/kg	4.05 J	5.39 J	4.12 J	5.75 J
Lead	mg/kg	400	518	541	1050
Zinc	mg/kg	952	1600	1310	1860

ASR Number: 3152 **RLAB Approved Sample Analysis Results** **09/20/2006**

Project ID: EMA78Q00 **Project Desc:** United Zinc No. 1 site sampling

Analysis/ Analyte	Units	13-__	14-__	15-__	16-__
1 Metals in Solids by ICP					
Arsenic	mg/kg	18.0	16.6	8.74 U	8.51 U
Barium	mg/kg	203	230	198	177
Cadmium	mg/kg	6.71 J	6.32 J	4.86 J	2.35 J
Lead	mg/kg	1050	1010	582	996
Zinc	mg/kg	2020	2660	1750	645

ASR Number: 3152 **RLAB Approved Sample Analysis Results** **09/20/2006**

Project ID: EMA78Q00 **Project Desc:** United Zinc No. 1 site sampling

Analysis/ Analyte	Units	17-__	18-__	19-__	20-__
1 Metals in Solids by ICP					
Arsenic	mg/kg	29.9	7.81 U	21.6	8.09 U
Barium	mg/kg	252	148	208	184
Cadmium	mg/kg	24.4 J	2.40 J	7.73 J	3.42 J
Lead	mg/kg	2010	270	1270	600
Zinc	mg/kg	6230	686	3680	917

United States Environmental Protection Agency
Region VII
901 N. 5th Street
Kansas City, KS 66101

Date: __/__/____

Subject: Data Disposition/Sample Release for ASR #: 3152

Project ID: EMA78Q00

Project Description: United Zinc No. 1 site sampling

From: Eddie McGlasson
SUPR/ER&R

To: Kaye Dollmann
ENSV/RLAB/CATS

I have received and reviewed the Transmittal of Sample Analysis Results for the above-referenced Analytical Services Request(ASR) and have indicated my findings below by checking one of the boxes for Data Disposition.

☐ "RELEASED" - Read-only to all Region 7 employees and contractors that have R7LIMS "Customer" account.

☐ "Project Manager Accessible" - Available on the LAN in R7LIMS for my use only.

☐ "Archived" - THIS DATA IS OF A SENSITIVE NATURE. Any future reports must be requested through the laboratory.

I have determined that the samples need to be held until _____, after which time they will be disposed of in accordance with applicable regulations. I understand that if I do not specify a "hold until" date, the process for proper disposal of the samples will be initiated 30 days after the date on the data transmittal.

United States Environmental Protection Agency
Region 7
901 N. 5th Street
Kansas City, KS 66101

Date: 10/12/2006

Subject: Transmittal of Sample Analysis Results for ASR #: 3153

Project ID: EMA78Q00

Project Description: United Zinc No. 1 site sampling

From: Dale I. Bates, Director
Regional Laboratory, Environmental Services Division

To: Eddie McGlasson
SUPR/ER&R

Enclosed are the analytical data for the above-referenced Analytical Services Request (ASR) and Project. The Regional Laboratory has reviewed and verified the results in accordance with procedures described in our Quality Manual (QM). In addition to all of the analytical results, this transmittal contains pertinent information that may have influenced the reported results and documents any deviations from the established requirements of the QM.

Please contact us within 14 days of receipt of this package if you determine there is a need for any changes. Please complete the enclosed Customer Satisfaction Survey and Data Disposition/Sample Release memo for this ASR as soon as possible. The process of disposing of the samples for this ASR will be initiated 30 days from the date of this transmittal unless an alternate release date is specified on the Data Disposition/Sample Release memo.

If you have any questions or concerns relating to this data package, contact our customer service line at 913-551-5295.

Enclosures

cc: Analytical Data File.

Project Manager: Eddie McGlasson **Org:** SUPR/ER&R **Phone:** 913-551-7756
Project ID: EMA78Q00
Project Desc: United Zinc No. 1 site sampling
Location: Iola **State:** Kansas **Program:** Superfund
Site Name: United Zinc No. 1 - **Site ID:** A78Q **Site OU:** 00
Purpose: Site Characterization **GPRA PRC:** 302DC6C

Explanation of Codes, Units and Qualifiers used on this report

Sample QC Codes: QC Codes identify the type of sample for quality control purpose.

__ = Field Sample

Units: Specific units in which results are reported.

% = Percent
mg/kg = Milligrams per Kilogram

Data Qualifiers: Specific codes used in conjunction with data values to provide additional information on the quality of reported results, or used to explain the absence of a specific value.

(Blank)= Values have been reviewed and found acceptable for use.
U = The analyte was not detected at or above the reporting limit.

ASR Number: 3153 **Sample Information Summary** **10/12/2006**

Project ID: EMA78Q00 **Project Desc:** United Zinc No. 1 site sampling

Sample No	QC Code	Matrix	Location Description	External Sample No	Start Date	Start Time	End Date	End Time	Receipt Date
1 -	__	Solid	EPA 373, Cell #1 (622 North Colborn)		09/06/2006	16:35			09/18/2006
2 -	__	Solid	EPA 364, Cell #2 (218 South Cottonwood)		09/07/2006	13:50			09/18/2006
3 -	__	Solid	EPA 330, Cell #2 (512 South Colborn)		09/08/2006	11:20			09/18/2006
4 -	__	Solid	EPA #392, Cell #1 (520 South Colborn)		09/11/2006	13:50			09/18/2006
5 -	__	Solid	EPA 333, Cell #1 (423 South Colborn)		09/11/2006	14:20			09/18/2006
6 -	__	Solid	EPA 274, Cell #2 (623 South Sycamore)		09/11/2006	16:50			09/18/2006
7 -	__	Solid	EPA 344, Cell #2 (216 South Colborn)		09/12/2006	09:20			09/18/2006
8 -	__	Solid	EPA 346, Cell #2 (214 South Colborn)		09/12/2006	11:15			09/18/2006
9 -	__	Solid	EPA 389, Cell #3 (321 South 2nd)		09/12/2006	13:45			09/18/2006
10 -	__	Solid	EPA 356, Cell #1 (309 South 4th)		09/12/2006	15:45			09/18/2006
11 -	__	Solid	EPA 255, Cell #1 (307 North Sycamore) (Post-exc)		09/12/2006	16:25			09/18/2006
12 -	__	Solid	EPA 354, Cell #1 (301 North Buckeye)		09/13/2006	17:05			09/18/2006
13 -	__	Solid	EPA 41, Cell #3 (405 South)		09/14/2006	08:10			09/18/2006
14 -	__	Solid	EPA 394, Cell #1 (510 South Street)		09/14/2006	10:35			09/18/2006
15 -	__	Solid	EPA 337, Cell #1 (822 South Street)		09/14/2006	11:15			09/18/2006
16 -	__	Solid	EPA 378, Cell #2 (716 South Chestnut)		09/15/2006	11:20			09/18/2006
17 -	__	Solid	EPA 341, Cell #1 (715 South Washington)		09/15/2006	12:45			09/18/2006

Analysis	Comments About Results For This Analysis

1 Metals in Solids by ICP

Lab: Region 7 EPA Laboratory - Kansas City, Ks.

Method: EPA Region 7 RLAB Method 3122.3B

Samples: 1-__ 2-__ 3-__ 4-__ 5-__ 6-__ 7-__
8-__ 9-__ 10-__ 11-__ 12-__ 13-__ 14-__
15-__ 16-__ 17-__

Comments:
(N/A)

1 Percent Solid

Lab: Region 7 EPA Laboratory - Kansas City, Ks.

Method: EPA Region 7 RLAB Method 3142.9D

Samples: 1-__ 2-__ 3-__ 4-__ 5-__ 6-__ 7-__
8-__ 9-__ 10-__ 11-__ 12-__ 13-__ 14-__
15-__ 16-__ 17-__

Comments:
(N/A)

ASR Number: 3153 **RLAB Approved Sample Analysis Results** **10/12/2006**

Project ID: EMA78Q00 **Project Desc:** United Zinc No. 1 site sampling

Analysis/ Analyte	Units	1-__	2-__	3-__	4-__
1 Metals in Solids by ICP					
Arsenic	mg/kg	5 U	5 U	5 U	5 U
Barium	mg/kg	122	204	161	103
Cadmium	mg/kg	7.81	8.75	6.57	9.96
Lead	mg/kg	412	275	204	460
Zinc	mg/kg	1190	437	476	1050
1 Percent Solid					
Solids, percent	%	88.3	91.5	92.1	91.5

ASR Number: 3153 **RLAB Approved Sample Analysis Results** **10/12/2006**

Project ID: EMA78Q00 **Project Desc:** United Zinc No. 1 site sampling

Analysis/ Analyte	Units	5-__	6-__	7-__	8-__
1 Metals in Solids by ICP					
Arsenic	mg/kg	5 U	5 U	5 U	5 U
Barium	mg/kg	145	162	156	249
Cadmium	mg/kg	10.2	6.75	9.85	9.98
Lead	mg/kg	566	166	504	420
Zinc	mg/kg	1080	351	1460	1080
1 Percent Solid					
Solids, percent	%	92.3	87.7	92.7	90.8

Analysis/ Analyte	Units	9-__	10-__	11-__	12-__
1 Metals in Solids by ICP					
Arsenic	mg/kg	5 U	5 U	7.34	5 U
Barium	mg/kg	137	141	155	134
Cadmium	mg/kg	6.34	9.07	10.5	7.05
Lead	mg/kg	296	484	738	406
Zinc	mg/kg	544	1150	1350	883
1 Percent Solid					
Solids, percent	%	91.7	91.1	89.2	92.6

ASR Number: 3153 **RLAB Approved Sample Analysis Results** **10/12/2006**

Project ID: EMA78Q00 **Project Desc:** United Zinc No. 1 site sampling

Analysis/ Analyte	Units	13-__	14-__	15-__	16-__
1 Metals in Solids by ICP					
Arsenic	mg/kg	64.0	24.5	8.75	5 U
Barium	mg/kg	173	171	249	160
Cadmium	mg/kg	17.6	9.02	11.3	10.0
Lead	mg/kg	1690	523	699	1050
Zinc	mg/kg	2820	1090	1600	1950
1 Percent Solid					
Solids, percent	%	86.1	87.3	95.9	94.9

Analysis/ Analyte	Units	17-__
1 Metals in Solids by ICP		
Arsenic	mg/kg	5 U
Barium	mg/kg	159
Cadmium	mg/kg	8.83
Lead	mg/kg	515
Zinc	mg/kg	1170
1 Percent Solid		
Solids, percent	%	93.1

United States Environmental Protection Agency
Region VII
901 N. 5th Street
Kansas City, KS 66101

Date: __/__/____

Subject: Data Disposition/Sample Release for ASR #: 3153

Project ID: EMA78Q00

Project Description: United Zinc No. 1 site sampling

From: Eddie McGlasson
SUPR/ER&R

To: Kaye Dollmann
ENSV/RLAB/CATS

I have received and reviewed the Transmittal of Sample Analysis Results for the above-referenced Analytical Services Request(ASR) and have indicated my findings below by checking one of the boxes for Data Disposition.

☐ "RELEASED" - Read-only to all Region 7 employees and contractors that have R7LIMS "Customer" account.

☐ "Project Manager Accessible" - Available on the LAN in R7LIMS for my use only.

☐ "Archived" - THIS DATA IS OF A SENSITIVE NATURE. Any future reports must be requested through the laboratory.

I have determined that the samples need to be held until _____, after which time they will be disposed of in accordance with applicable regulations. I understand that if I do not specify a "hold until" date, the process for proper disposal of the samples will be initiated 30 days after the date on the data transmittal.

United States Environmental Protection Agency
Region 7
901 N. 5th Street
Kansas City, KS 66101

Date: 10/18/2006

Subject: Transmittal of Sample Analysis Results for ASR #: 3154

Project ID: EMA78Q00

Project Description: United Zinc No. 1 site sampling

From: Dale I. Bates, Director
Regional Laboratory, Environmental Services Division

To: Eddie McGlasson
SUPR/ER&R

Enclosed are the analytical data for the above-referenced Analytical Services Request (ASR) and Project. The Regional Laboratory has reviewed and verified the results in accordance with procedures described in our Quality Manual (QM). In addition to all of the analytical results, this transmittal contains pertinent information that may have influenced the reported results and documents any deviations from the established requirements of the QM.

Please contact us within 14 days of receipt of this package if you determine there is a need for any changes. Please complete the enclosed Customer Satisfaction Survey and Data Disposition/Sample Release memo for this ASR as soon as possible. The process of disposing of the samples for this ASR will be initiated 30 days from the date of this transmittal unless an alternate release date is specified on the Data Disposition/Sample Release memo.

If you have any questions or concerns relating to this data package, contact our customer service line at 913-551-5295.

Enclosures

cc: Analytical Data File.

Project Manager: Eddie McGlasson **Org:** SUPR/ER&R **Phone:** 913-551-7756
Project ID: EMA78Q00
Project Desc: United Zinc No. 1 site sampling
Location: Iola **State:** Kansas **Program:** Superfund
Site Name: United Zinc No. 1 - **Site ID:** A78Q **Site OU:** 00
Purpose: Site Characterization **GPRA PRC:** 302DC6C

Explanation of Codes, Units and Qualifiers used on this report

Sample QC Codes: QC Codes identify the type of sample for quality control purpose.

__ = Field Sample

Units: Specific units in which results are reported.

mg/kg = Milligrams per Kilogram

Data Qualifiers: Specific codes used in conjunction with data values to provide additional information on the quality of reported results, or used to explain the absence of a specific value.

(Blank)= Values have been reviewed and found acceptable for use.

ASR Number: 3154 **Sample Information Summary** **10/18/2006**

Project ID: EMA78Q00 **Project Desc:** United Zinc No. 1 site sampling

Sample No	QC Code	Matrix	Location Description	External Sample No	Start Date	Start Time	End Date	End Time	Receipt Date
1 -	__	Solid	EPA 444, Cell #3 (328 South Ohio)		09/18/2006	12:00			10/02/2006
2 -	__	Solid	EPA 414, Cell #4 (321 South Elan)		09/18/2006	16:50			10/02/2006
3 -	__	Solid	EPA 408, Cell #3 (324 South Oak)		09/19/2006	11:00			10/02/2006
4 -	__	Solid	EPA 396, Cell #1 (216 South 2nd)		09/19/2006	15:45			10/02/2006
5 -	__	Solid	EPA 435, Cell #2		09/21/2006	15:15			10/02/2006
6 -	__	Solid	EPA 558, Cell #2 (524 South 2nd)		09/25/2006	14:50			10/02/2006
7 -	__	Solid	EPA 65, Cell #2 (210 North 1st)		09/25/2006	15:56			10/02/2006
8 -	__	Solid	EPA 541, Cell #2 (624 East Madison)		09/25/2006	11:40			10/02/2006
9 -	__	Solid	EPA 411, Cell #1 (8 West Campbell)		09/27/2006	09:50			10/02/2006
10 -	__	Solid	EPA site 397, Cell #3 (322 South Washington)		09/16/2006	16:15			10/02/2006
11 -	__	Solid	EPA 452, Cell #5 (410 South Chestnut)		09/20/2006	09:50			10/02/2006
12 -	__	Solid	EPA 467, Cell #4 (411 South Chestnut)		09/20/2006	14:05			10/02/2006
13 -	__	Solid	EPA 467, Cell #2 (411 South Chestnut)		09/20/2006	13:50			10/02/2006
14 -	__	Solid	EPA 434, Cell #1 (302 North Chestnut)		09/21/2006	10:42			10/02/2006
15 -	__	Solid	EPA 463, Cell #2		09/21/2006	11:05			10/02/2006
16 -	__	Solid	EPA 404, Cell #1 (316 North 1st)		09/21/2006	11:50			10/02/2006
17 -	__	Solid	EPA 433, Cell #1 (501 South Cottonwood)		09/21/2006	14:00			10/02/2006
18 -	__	Solid	EPA 406, Cell #1 (427 North Vermont)		09/21/2006	14:41			10/02/2006
19 -	__	Solid	EPA 431, Cell #3		09/25/2006	14:58			10/02/2006
20 -	__	Solid	EPA 416, Cell #3		09/25/2006	16:26			10/02/2006
21 -	__	Solid	EPA 458, Cell #3		09/26/2006	08:02			10/02/2006
22 -	__	Solid	EPA 547, Cell #4		09/26/2006	09:08			10/02/2006
23 -	__	Solid	EPA 387, Cell #3		09/26/2006	11:30			10/02/2006
24 -	__	Solid	EPA 524, Cell #3		09/26/2006	14:30			10/02/2006
25 -	__	Solid	EPA 565, Cell #1		09/26/2006	16:30			10/02/2006
26 -	__	Solid	EPA 579, Cell #2		09/27/2006	09:00			10/02/2006
27 -	__	Solid	EPA 579 (Cell #4)		09/27/2006	09:10			10/02/2006
28 -	__	Solid	EPA 567, Cell #5		09/27/2006	10:58			10/02/2006
29 -	__	Solid	EPA 554, Cell #3		09/27/2006	14:20			10/02/2006
30 -	__	Solid	EPA 588, Cell #1		09/28/2006	08:49			10/02/2006
31 -	__	Solid	EPA 588, Cell #3		09/28/2006	08:51			10/02/2006
32 -	__	Solid	EPA 593, Cell #1		09/28/2006	15:18			10/02/2006
33 -	__	Solid	EPA 591, Cell #2		09/28/2006	16:00			10/02/2006
34 -	__	Solid	EPA 468, Cell #2 (418 South Street)		09/28/2006	15:20			10/02/2006
35 -	__	Solid	EPA 532, Cell #2 (15 North Buckeye)		09/29/2006	09:56			10/02/2006

Analysis	Comments About Results For This Analysis

1 Metals in Solids by ICP

Lab: Contract Lab Program (Out-Source)

Method: CLP Statement of Work

Samples:						
1-__	2-__	3-__	4-__	5-__	6-__	7-__
8-__	9-__	10-__	11-__	12-__	13-__	14-__
15-__	16-__	17-__	18-__	19-__	20-__	21-__
22-__	23-__	24-__	25-__	26-__	27-__	28-__
29-__	30-__	31-__	32-__	33-__	34-__	35-__

Comments:
(N/A)

ASR Number: 3154 **RLAB Approved Sample Analysis Results** **10/18/2006**

Project ID: EMA78Q00 **Project Desc:** United Zinc No. 1 site sampling

Analysis/ Analyte	Units	1-__	2-__	3-__	4-__
1 Metals in Solids by ICP					
Arsenic	mg/kg	9.93	8.14	10.1	9.51
Barium	mg/kg	196	107	156	164
Cadmium	mg/kg	3.78	4.61	4.87	4.56
Lead	mg/kg	329	593	635	509
Zinc	mg/kg	844	1270	1320	1080

ASR Number: 3154 **RLAB Approved Sample Analysis Results** **10/18/2006**

Project ID: EMA78Q00 **Project Desc:** United Zinc No. 1 site sampling

Analysis/ Analyte	**Units**	**5-__**	**6-__**	**7-__**	**8-__**
1 Metals in Solids by ICP					
Arsenic	mg/kg	5.12	10.9	21.5	9.20
Barium	mg/kg	167	244	264	195
Cadmium	mg/kg	2.43	4.29	8.01	4.94
Lead	mg/kg	255	761	1480	568
Zinc	mg/kg	610	1370	2730	1440

Analysis/ Analyte	Units	9-__	10-__	11-__	12-__
1 Metals in Solids by ICP					
Arsenic	mg/kg	13.6	14.6	13.7	13.2
Barium	mg/kg	210	283	192	229
Cadmium	mg/kg	7.77	5.45	12.1	5.79
Lead	mg/kg	1280	1390	1380	857
Zinc	mg/kg	2140	1400	13100	1730

Project ID: EMA78Q00 **Project Desc:** United Zinc No. 1 site sampling

Analysis/ Analyte	Units	13-__	14-__	15-__	16-__
1 Metals in Solids by ICP					
Arsenic	mg/kg	15.2	15.2	15.0	20.0
Barium	mg/kg	679	204	151	182
Cadmium	mg/kg	5.43	7.58	4.24	9.67
Lead	mg/kg	1040	916	1140	748
Zinc	mg/kg	2020	1910	1160	2040

Analysis/ Analyte	Units	17-__	18-__	19-__	20-__
1 Metals in Solids by ICP					
Arsenic	mg/kg	10.3	8.49	5.29	6.23
Barium	mg/kg	145	149	197	233
Cadmium	mg/kg	3.91	10.8	2.83	3.07
Lead	mg/kg	719	449	380	264
Zinc	mg/kg	1170	1680	614	595

Analysis/ Analyte	Units	21-__	22-__	23-__	24-__
1 Metals in Solids by ICP					
Arsenic	mg/kg	5.84	10.1	9.46	9.06
Barium	mg/kg	110	159	231	158
Cadmium	mg/kg	1.82	4.41	3.95	2.28
Lead	mg/kg	232	581	461	189
Zinc	mg/kg	448	1090	769	455

ASR Number: 3154 **RLAB Approved Sample Analysis Results** **10/18/2006**

Project ID: EMA78Q00 **Project Desc:** United Zinc No. 1 site sampling

Analysis/ Analyte	Units	25-__	26-__	27-__	28-__
1 Metals in Solids by ICP					
Arsenic	mg/kg	26.5	11.3	10.2	21.9
Barium	mg/kg	108	347	266	137
Cadmium	mg/kg	6.52	6.67	4.16	6.49
Lead	mg/kg	1410	1500	839	1190
Zinc	mg/kg	2470	2100	1020	1830

ASR Number: 3154 **RLAB Approved Sample Analysis Results** **10/18/2006**

Project ID: EMA78Q00 **Project Desc:** United Zinc No. 1 site sampling

Analysis/ Analyte	Units	29-__	30-__	31-__	32-__
1 Metals in Solids by ICP					
Arsenic	mg/kg	16.2	13.2	19.6	52.9
Barium	mg/kg	159	227	210	204
Cadmium	mg/kg	2.51	5.62	5.88	7.98
Lead	mg/kg	916	970	1690	2520
Zinc	mg/kg	800	1570	1910	2300

Analysis/ Analyte	Units	33-__	34-__	35-__
1 Metals in Solids by ICP				
Arsenic	mg/kg	21.4	14.3	116
Barium	mg/kg	134	224	148
Cadmium	mg/kg	6.41	8.10	10.4
Lead	mg/kg	1230	1010	1920
Zinc	mg/kg	2080	2350	3160

United States Environmental Protection Agency
Region VII
901 N. 5th Street
Kansas City, KS 66101

Date: __/__/____

Subject: Data Disposition/Sample Release for ASR #: 3154

Project ID: EMA78Q00

Project Description: United Zinc No. 1 site sampling

From: Eddie McGlasson
SUPR/ER&R

To: Kaye Dollmann
ENSV/RLAB/CATS

I have received and reviewed the Transmittal of Sample Analysis Results for the above-referenced Analytical Services Request(ASR) and have indicated my findings below by checking one of the boxes for Data Disposition.

☐ "RELEASED" - Read-only to all Region 7 employees and contractors that have R7LIMS "Customer" account.

☐ "Project Manager Accessible" - Available on the LAN in R7LIMS for my use only.

☐ "Archived" - THIS DATA IS OF A SENSITIVE NATURE. Any future reports must be requested through the laboratory.

I have determined that the samples need to be held until _____, after which time they will be disposed of in accordance with applicable regulations. I understand that if I do not specify a "hold until" date, the process for proper disposal of the samples will be initiated 30 days after the date on the data transmittal.

United States Environmental Protection Agency
Region 7
901 N. 5th Street
Kansas City, KS 66101

Date: 11/09/2006

Subject: Transmittal of Sample Analysis Results for ASR #: 3155

Project ID: EMA78Q00

Project Description: United Zinc No. 1 site sampling

From: Dale I. Bates, Director
Regional Laboratory, Environmental Services Division

To: Eddie McGlasson
SUPR/ER&R

Enclosed are the analytical data for the above-referenced Analytical Services Request (ASR) and Project. The Regional Laboratory has reviewed and verified the results in accordance with procedures described in our Quality Manual (QM). In addition to all of the analytical results, this transmittal contains pertinent information that may have influenced the reported results and documents any deviations from the established requirements of the QM.

Please contact us within 14 days of receipt of this package if you determine there is a need for any changes. Please complete the enclosed Customer Satisfaction Survey and Data Disposition/Sample Release memo for this ASR as soon as possible. The process of disposing of the samples for this ASR will be initiated 30 days from the date of this transmittal unless an alternate release date is specified on the Data Disposition/Sample Release memo.

If you have any questions or concerns relating to this data package, contact our customer service line at 913-551-5295.

Enclosures

cc: Analytical Data File.

Project Manager: Eddie McGlasson **Org:** SUPR/ER&R **Phone:** 913-551-7756
Project ID: EMA78Q00
Project Desc: United Zinc No. 1 site sampling
Location: Iola **State:** Kansas **Program:** Superfund
Site Name: United Zinc No. 1 - **Site ID:** A78Q **Site OU:** 00
Purpose: Site Characterization **GPRA PRC:** 302DC6C

Explanation of Codes, Units and Qualifiers used on this report

Sample QC Codes: QC Codes identify the type of sample for quality control purpose.

__ = Field Sample

Units: Specific units in which results are reported.

% = Percent
mg/kg = Milligrams per Kilogram

Data Qualifiers: Specific codes used in conjunction with data values to provide additional information on the quality of reported results, or used to explain the absence of a specific value.

(Blank)= Values have been reviewed and found acceptable for use.
J = The identification of the analyte is acceptable; the reported value is an estimate.

Project ID: EMA78Q00 **Project Desc:** United Zinc No. 1 site sampling

Sample No	QC Code	Matrix	Location Description	External Sample No	Start Date	Start Time	End Date	End Time	Receipt Date
1 -	__	Solid	EPA 531, Cell #2 (706 East Jackson)		10/02/2006	14:10			10/16/2006
2 -	__	Solid	EPA 505, Cell #2 (416 East Lincoln)		10/03/2006	09:45			10/16/2006
3 -	__	Solid	EPA 515, Cell #1 (618 East Lincoln)		10/03/2006	13:05			10/16/2006
4 -	__	Solid	EPA 514, Cell #1 (611 East Lincoln)		10/03/2006	14:06			10/16/2006
5 -	__	Solid	EPA 625, Cell #1 (202 South Cottonwood)		10/04/2006	12:35			10/16/2006
6 -	__	Solid	EPA 234, Cell #3 (5 East Irwin)		10/04/2006	10:25			10/16/2006
7 -	__	Solid	EPA 486, Cell #2 (704 East Carpenter)		10/04/2006	10:45			10/16/2006
8 -	__	Solid	EPA 610, Cell #1 (310 South 4th)		10/04/2006	12:40			10/16/2006
9 -	__	Solid	EPA 607, Cell #1 (526 South 4th)		10/04/2006	13:15			10/16/2006
10 -	__	Solid	EPA 659, Cell #1 (22 South Ohio Street)		10/05/2006	16:30			10/16/2006
11 -	__	Solid	EPA 234, Cell #2 (5 East Irwin Street)		10/05/2006	14:56			10/16/2006
12 -	__	Solid	EPA 601 (401 South Chestnut)		10/05/2006	09:00			10/16/2006
13 -	__	Solid	EPA 664, Cell #1 (315 South Washington)		10/05/2006	13:15			10/16/2006
14 -	__	Solid	EPA 662, Cell #3 (206 South Kentucky)		10/05/2006	16:30			10/16/2006
15 -	__	Solid	EPA 621, Cell #1 (617 East Broadway)		10/06/2006	12:56			10/16/2006
16 -	__	Solid	EPA 553, Cell #6 (519 East Madison)		10/06/2006	11:27			10/16/2006
17 -	__	Solid	EPA 658, Cell #1 (611 North Oak)		10/09/2006	17:15			10/16/2006
18 -	__	Solid	EPA 720, Cell #1		10/10/2006	11:20			10/16/2006
19 -	__	Solid	EPA 710, Cell #5 (402 South 4th)		10/10/2006	15:14			10/16/2006
20 -	__	Solid	EPA 683, Cell #4 (D. Beck - 311 Kansas Drive)		10/11/2006	10:30			10/16/2006
21 -	__	Solid	EPA 685, Cell #3 (R. Thyer - 421 Kansas Drive)		10/11/2006	11:26			10/16/2006
22 -	__	Solid	EPA 672, Cell #5 (S. Orear - 427 Kansas Drive)		10/11/2006	13:45			10/16/2006
23 -	__	Solid	EPA 688, Cell #1 (J. Oberg - 519 Kansas Drive)		10/11/2006	15:30			10/16/2006
24 -	__	Solid	EPA 676, Cell #2 (R. Hardwick - 716 Kansas Drive)		10/11/2006	16:18			10/16/2006
25 -	__	Solid	EPA 366, Cell #1 (411 South Cottonwood)		10/11/2006	16:30			10/16/2006
26 -	__	Solid	EPA 725, Cell #1 (422 East Street)		10/12/2006	09:20			10/16/2006
27 -	__	Solid	EPA 717, Cell #1 (701 North Street)		10/12/2006	11:00			10/16/2006
28 -	__	Solid	EPA 679, Cell #4 (I. Findley - 602 Kennedy Drive)		10/12/2006	11:07			10/16/2006
29 -	__	Solid	EPA 680, Cell #1 (R. Williams - 414 Kennedy Drive)		10/12/2006	11:45			10/16/2006
30 -	__	Solid	EPA 703, Cell #3 (W. Newman - 306 Briarwood Drive)		10/12/2006	14:15			10/16/2006
31 -	__	Solid	EPA 694, Cell #1 (L.E. Roush - 503 East Lincoln)		10/12/2006	16:40			10/16/2006
32 -	__	Solid	EPA 635, Cell #2 (C. Dreher - 120 East Garfield)		10/13/2006	09:55			10/16/2006
33 -	__	Solid	EPA 699, Cell #2 (301 East Broadway)		10/13/2006	09:50			10/16/2006

Analysis	**Comments About Results For This Analysis**

1 Metals in Solids by ICP

Lab: Region 7 EPA Laboratory - Kansas City, Ks.

Method: EPA Region 7 RLAB Method 3122.3B

Samples:						
1-__	2-__	3-__	4-__	5-__	6-__	7-__
8-__	9-__	10-__	11-__	12-__	13-__	14-__
15-__	16-__	17-__	18-__	19-__	20-__	21-__
22-__	23-__	24-__	25-__	26-__	27-__	28-__
29-__	30-__	31-__	32-__	33-__		

Comments:

Lead was J-coded in sample 1. Although the analyte in question has been positively identified in the sample, the quantitation is an estimate (J-coded) due to poor precision obtained for this analyte in the laboratory matrix spike and matrix spike duplicate.

1 Percent Solid

Lab: Region 7 EPA Laboratory - Kansas City, Ks.

Method: EPA Region 7 RLAB Method 3142.9D

Samples:						
1-__	2-__	3-__	4-__	5-__	6-__	7-__
8-__	9-__	10-__	11-__	12-__	13-__	14-__
15-__	16-__	17-__	18-__	19-__	20-__	21-__
22-__	23-__	24-__	25-__	26-__	27-__	28-__
29-__	30-__	31-__	32-__	33-__		

Comments:

(N/A)

ASR Number: 3155 **RLAB Approved Sample Analysis Results** **11/09/2006**

Project ID: EMA78Q00 **Project Desc:** United Zinc No. 1 site sampling

Analysis/ Analyte	Units	1-__	2-__	3-__	4-__
1 Metals in Solids by ICP					
Arsenic	mg/kg	10.7	16.8	23.1	20.1
Barium	mg/kg	232	276	191	157
Cadmium	mg/kg	6.04	6.09	9.67	6.86
Lead	mg/kg	337 J	397	683	908
Zinc	mg/kg	792	1020	2250	1640
1 Percent Solid					
Solids, percent	%	94.9	95.6	96.3	91.9

Project ID: EMA78Q00 **Project Desc:** United Zinc No. 1 site sampling

Analysis/ Analyte	Units	5-__	6-__	7-__	8-__
1 Metals in Solids by ICP					
Arsenic	mg/kg	14.1	42.4	8.60	8.11
Barium	mg/kg	155	395	221	156
Cadmium	mg/kg	8.61	14.9	7.63	9.34
Lead	mg/kg	993	796	117	676
Zinc	mg/kg	1930	4210	435	1820
1 Percent Solid					
Solids, percent	%	86.7	91.2	94.5	88.7

ASR Number: 3155 **RLAB Approved Sample Analysis Results** **11/09/2006**

Project ID: EMA78Q00 **Project Desc:** United Zinc No. 1 site sampling

Analysis/ Analyte	Units	9-__	10-__	11-__	12-__
1 Metals in Solids by ICP					
Arsenic	mg/kg	21.8	11.5	125	19.3
Barium	mg/kg	127	227	223	152
Cadmium	mg/kg	10.8	11.2	22.2	11.5
Lead	mg/kg	1410	785	6430	1060
Zinc	mg/kg	2720	2070	7990	3150
1 Percent Solid					
Solids, percent	%	92.5	90.1	92.6	92.0

Project ID: EMA78Q00 **Project Desc:** United Zinc No. 1 site sampling

Analysis/ Analyte	Units	13-__	14-__	15-__	16-__
1 Metals in Solids by ICP					
Arsenic	mg/kg	10.4	17.2	10.5	8.89
Barium	mg/kg	121	133	95.1	149
Cadmium	mg/kg	8.69	11.2	11.1	6.96
Lead	mg/kg	759	1250	1870	507
Zinc	mg/kg	1620	2580	1870	930
1 Percent Solid					
Solids, percent	%	93.3	93.8	94.5	89.6

ASR Number: 3155 **RLAB Approved Sample Analysis Results** **11/09/2006**

Project ID: EMA78Q00 **Project Desc:** United Zinc No. 1 site sampling

Analysis/ Analyte	Units	17-__	18-__	19-__	20-__
1 Metals in Solids by ICP					
Arsenic	mg/kg	130	13.1	13.4	8.01
Barium	mg/kg	197	140	168	197
Cadmium	mg/kg	12.0	8.27	10.3	8.98
Lead	mg/kg	3810	701	789	176
Zinc	mg/kg	3220	1680	2480	822
1 Percent Solid					
Solids, percent	%	92.5	89.8	85.9	71.0

Project ID: EMA78Q00 **Project Desc:** United Zinc No. 1 site sampling

Analysis/ Analyte	Units	21-__	22-__	23-__	24-__
1 Metals in Solids by ICP					
Arsenic	mg/kg	7.51	7.94	7.77	12.6
Barium	mg/kg	117	151	143	182
Cadmium	mg/kg	8.91	10.7	8.81	8.37
Lead	mg/kg	196	228	297	228
Zinc	mg/kg	823	1050	936	846
1 Percent Solid					
Solids, percent	%	71.9	74.5	78.6	77.9

Analysis/ Analyte	Units	25-__	26-__	27-__	28-__
1 Metals in Solids by ICP					
Arsenic	mg/kg	13.0	10.1	16.8	8.05
Barium	mg/kg	435	160	140	129
Cadmium	mg/kg	7.65	9.16	10.4	7.53
Lead	mg/kg	380	482	764	225
Zinc	mg/kg	778	1890	2370	855
1 Percent Solid					
Solids, percent	%	84.4	80.1	76.4	84.1

ASR Number: 3155 **RLAB Approved Sample Analysis Results** **11/09/2006**

Project ID: EMA78Q00 **Project Desc:** United Zinc No. 1 site sampling

Analysis/ Analyte	Units	29-__	30-__	31-__	32-__
1 Metals in Solids by ICP					
Arsenic	mg/kg	10.3	9.76	15.1	9.26
Barium	mg/kg	173	160	121	165
Cadmium	mg/kg	11.5	8.89	6.96	7.17
Lead	mg/kg	359	397	521	241
Zinc	mg/kg	1370	1400	1100	679
1 Percent Solid					
Solids, percent	%	77.5	82.5	82.9	77.7

Analysis/ Analyte	Units	33-__
1 Metals in Solids by ICP		
Arsenic	mg/kg	13.1
Barium	mg/kg	161
Cadmium	mg/kg	8.20
Lead	mg/kg	794
Zinc	mg/kg	1550
1 Percent Solid		
Solids, percent	%	83.7

United States Environmental Protection Agency
Region VII
901 N. 5th Street
Kansas City, KS 66101

Date: __/__/____

Subject: Data Disposition/Sample Release for ASR #: 3155

Project ID: EMA78Q00

Project Description: United Zinc No. 1 site sampling

From: Eddie McGlasson
SUPR/ER&R

To: Kaye Dollmann
ENSV/RLAB/CATS

I have received and reviewed the Transmittal of Sample Analysis Results for the above-referenced Analytical Services Request(ASR) and have indicated my findings below by checking one of the boxes for Data Disposition.

☐ "RELEASED" - Read-only to all Region 7 employees and contractors that have R7LIMS "Customer" account.

☐ "Project Manager Accessible" - Available on the LAN in R7LIMS for my use only.

☐ "Archived" - THIS DATA IS OF A SENSITIVE NATURE. Any future reports must be requested through the laboratory.

I have determined that the samples need to be held until _____, after which time they will be disposed of in accordance with applicable regulations. I understand that if I do not specify a "hold until" date, the process for proper disposal of the samples will be initiated 30 days after the date on the data transmittal.

United States Environmental Protection Agency
Region 7
901 N. 5th Street
Kansas City, KS 66101

Date: 12/04/2006

Subject: Transmittal of Sample Analysis Results for ASR #: 3156

Project ID: EMA78Q00

Project Description: United Zinc No. 1 site sampling

From: Dale I. Bates, Director
Regional Laboratory, Environmental Services Division

To: Eddie McGlasson
SUPR/ER&R

Enclosed are the analytical data for the above-referenced Analytical Services Request (ASR) and Project. The Regional Laboratory has reviewed and verified the results in accordance with procedures described in our Quality Manual (QM). In addition to all of the analytical results, this transmittal contains pertinent information that may have influenced the reported results and documents any deviations from the established requirements of the QM.

Please contact us within 14 days of receipt of this package if you determine there is a need for any changes. Please complete the enclosed Customer Satisfaction Survey and Data Disposition/Sample Release memo for this ASR as soon as possible. The process of disposing of the samples for this ASR will be initiated 30 days from the date of this transmittal unless an alternate release date is specified on the Data Disposition/Sample Release memo.

If you have any questions or concerns relating to this data package, contact our customer service line at 913-551-5295.

Enclosures

cc: Analytical Data File.

Project Manager: Eddie McGlasson **Org:** SUPR/ER&R **Phone:** 913-551-7756
Project ID: EMA78Q00
Project Desc: United Zinc No. 1 site sampling
Location: Iola **State:** Kansas **Program:** Superfund
Site Name: United Zinc No. 1 - **Site ID:** A78Q **Site OU:** 00
Purpose: Site Characterization **GPRA PRC:** 302DC6C

Explanation of Codes, Units and Qualifiers used on this report

Sample QC Codes: QC Codes identify the type of sample for quality control purpose.

__ = Field Sample

Units: Specific units in which results are reported.

% = Percent
mg/kg = Milligrams per Kilogram

Data Qualifiers: Specific codes used in conjunction with data values to provide additional information on the quality of reported results, or used to explain the absence of a specific value.

(Blank)= Values have been reviewed and found acceptable for use.

Project ID: EMA78Q00 **Project Desc:** United Zinc No. 1 site sampling

Sample No	QC Code	Matrix	Location Description	External Sample No	Start Date	Start Time	End Date	End Time	Receipt Date
1 -	__	Solid	EPA 729, Cell #1 (525 South 3rd)		10/16/2006	17:15			10/30/2006
2 -	__	Solid	EPA 771, Cell #3 (822 South Street)		10/16/2006	11:47			10/30/2006
3 -	__	Solid	EPA 748, Cell #1 (319 East Irwin)		10/16/2006	13:09			10/30/2006
4 -	__	Solid	EPA 739, Cell #2 (220 North Colborn)		10/16/2006	16:45			10/30/2006
5 -	__	Solid	EPA 755, Cell #4 (423 South Chestnut)		10/17/2006	10:45			10/30/2006
6 -	__	Solid	EPA 745, Cell #4 (407 South Elm)		10/17/2006	11:01			10/30/2006
7 -	__	Solid	EPA 746, Cell #1 (206 South Elm)		10/17/2006	11:44			10/30/2006
8 -	__	Solid	EPA 753, Cell #1 (219 South Walnut)		10/17/2006	12:55			10/30/2006
9 -	__	Solid	EPA 617, Cell #3 (519 North Washington)		10/17/2006	14:33			10/30/2006
10 -	__	Solid	EPA 775, Cell #2 (522 North Washington)		10/17/2006	15:54			10/30/2006
11 -	__	Solid	EPA 621, Cell #4 (617 East Broadway)		10/18/2006	14:10			10/30/2006
12 -	__	Solid	EPA 781, Cell #1 (203 South Sycamore)		10/18/2006	15:25			10/30/2006
13 -	__	Solid	EPA 647, Cell #4 (404 North Jefferson)		10/18/2006	13:24			10/30/2006
14 -	__	Solid	EPA 632, Cell #3 (610 North Washington)		10/18/2006	10:39			10/30/2006
15 -	__	Solid	EPA 648, Cell #2 (410 North Jefferson)		10/18/2006	13:56			10/30/2006
16 -	__	Solid	EPA 651, Cell #3 (507 North Jefferson)		10/18/2006	17:27			10/30/2006
17 -	__	Solid	EPA 589, Cell #4 (2 North 3rd)		10/18/2006	08:48			10/30/2006
18 -	__	Solid	EPA 759, Cell #4 (521 North Jefferson)		10/19/2006	16:43			10/30/2006
19 -	__	Solid	EPA 443, Cell #1 (619 North Jefferson)		10/19/2006	11:03			10/30/2006
20 -	__	Solid	EPA 692, Cell #1 (623 North Jefferson)		10/19/2006	11:35			10/30/2006
21 -	__	Solid	EPA 613, Cell #4 (524 North Jefferson)		10/29/2006	14:30			10/30/2006
22 -	__	Solid	EPA 400, Cell #4 (812 North Jefferson)		10/19/2006	09:56			10/30/2006
23 -	__	Solid	EPA 621, Cell #2 (617 East Broadway)		10/19/2006	09:25			10/30/2006
24 -	__	Solid	EPA 793, Cell #3 (702 South 1st)		10/20/2006	11:39			10/30/2006
25 -	__	Solid	EPA 750, Cell #1 (816 East Jackson)		10/19/2006	15:05			10/30/2006
26 -	__	Solid	EPA 810, Cell #4 (520 East Spruce)		10/29/2006	09:25			10/30/2006
27 -	__	Solid	EPA 446, Cell #3 (411 North Sycamore)		10/20/2006	09:35			10/30/2006
28 -	__	Solid	EPA 764, Cell #2 (511 North Oak)		10/23/2006	14:55			10/30/2006
29 -	__	Solid	EPA 417, Cell #1 (505 North Sycamore)		10/24/2006	10:11			10/30/2006
30 -	__	Solid	EPA 796, Cell #1 (514 East Jackson)		10/24/2006	16:58			10/30/2006
31 -	__	Solid	EPA 895, Cell #1 (812 North Buckeye)		10/24/2006	14:43			10/30/2006
32 -	__	Solid	EPA 806, Cell #1 (815 North Buckeye)		10/24/2006	15:03			10/30/2006
33 -	__	Solid	EPA 787, Cell #1 (401 North 3rd Street)		10/24/2006	15:57			10/30/2006

Project ID: EMA78Q00 **Project Desc:** United Zinc No. 1 site sampling

Sample No	QC Code	Matrix	Location Description	External Sample No	Start Date	Start Time	End Date	End Time	Receipt Date
34 -	__	Solid	EPA 786, Cell #1 (915 North Jefferson)		10/25/2006	10:00			10/30/2006
35 -	__	Solid	EPA 500, Cell #2 (1315 East Douglas)		10/25/2006	14:25			10/30/2006
36 -	__	Solid	EPA 509, Cell #1 (923 East Douglas)		10/25/2060	16:27			10/30/2006
37 -	__	Solid	EPA 853, Cell #1 (202 South First)		10/26/2006	11:15			10/30/2006

Analysis	Comments About Results For This Analysis

1 Metals in Solids by ICP

Lab: Region 7 EPA Laboratory - Kansas City, Ks.

Method: EPA Region 7 RLAB Method 3122.3B

Samples:						
1-__	2-__	3-__	4-__	5-__	6-__	7-__
8-__	9-__	10-__	11-__	12-__	13-__	14-__
15-__	16-__	17-__	18-__	19-__	20-__	21-__
22-__	23-__	24-__	25-__	26-__	27-__	28-__
29-__	30-__	31-__	32-__	33-__	34-__	35-__
36-__	37-__					

Comments:
(N/A)

1 Percent Solid

Lab: Region 7 EPA Laboratory - Kansas City, Ks.

Method: EPA Region 7 RLAB Method 3142.9D

Samples:						
1-__	2-__	3-__	4-__	5-__	6-__	7-__
8-__	9-__	10-__	11-__	12-__	13-__	14-__
15-__	16-__	17-__	18-__	19-__	20-__	21-__
22-__	23-__	24-__	25-__	26-__	27-__	28-__
29-__	30-__	31-__	32-__	33-__	34-__	35-__
36-__	37-__					

Comments:
(N/A)

ASR Number: 3156 **RLAB Approved Sample Analysis Results** **12/04/2006**

Project ID: EMA78Q00 **Project Desc:** United Zinc No. 1 site sampling

Analysis/ Analyte	Units	1-__	2-__	3-__	4-__
1 Metals in Solids by ICP					
Arsenic	mg/kg	14.6	28.0	18.6	36.4
Barium	mg/kg	295	206	161	363
Cadmium	mg/kg	7.05	6.26	4.88	9.38
Lead	mg/kg	731	3620	458	1260
Zinc	mg/kg	1410	1960	865	2440
1 Percent Solid					
Solids, percent	%	83.3	82.7	73.1	72.3

ASR Number: 3156 **RLAB Approved Sample Analysis Results** **12/04/2006**

Project ID: EMA78Q00 **Project Desc:** United Zinc No. 1 site sampling

Analysis/ Analyte	Units	5-__	6-__	7-__	8-__
1 Metals in Solids by ICP					
Arsenic	mg/kg	37.8	8.49	12.0	11.6
Barium	mg/kg	256	145	157	354
Cadmium	mg/kg	6.26	5.45	7.68	5.75
Lead	mg/kg	1230	374	588	680
Zinc	mg/kg	1860	1100	1580	1320
1 Percent Solid					
Solids, percent	%	78.9	82.9	76.3	75.9

Project ID: EMA78Q00 **Project Desc:** United Zinc No. 1 site sampling

Analysis/ Analyte	Units	9-__	10-__	11-__	12-__
1 Metals in Solids by ICP					
Arsenic	mg/kg	6.88	21.3	11.8	9.96
Barium	mg/kg	197	389	271	214
Cadmium	mg/kg	4.27	9.26	6.17	7.30
Lead	mg/kg	265	1410	466	515
Zinc	mg/kg	1050	1910	1250	1610
1 Percent Solid					
Solids, percent	%	84.2	85.0	86.9	77.9

Analysis/ Analyte	Units	13-__	14-__	15-__	16-__
1 Metals in Solids by ICP					
Arsenic	mg/kg	10.9	20.1	21.3	35.7
Barium	mg/kg	199	243	355	290
Cadmium	mg/kg	7.46	6.35	9.60	16.6
Lead	mg/kg	420	746	1360	1780
Zinc	mg/kg	1820	1390	2750	2420
1 Percent Solid					
Solids, percent	%	76.0	80.9	80.7	77.1

ASR Number: 3156 **RLAB Approved Sample Analysis Results** **12/04/2006**

Project ID: EMA78Q00 **Project Desc:** United Zinc No. 1 site sampling

Analysis/ Analyte	Units	17-__	18-__	19-__	20-__
1 Metals in Solids by ICP					
Arsenic	mg/kg	17.6	33.9	178	42.3
Barium	mg/kg	206	233	190	156
Cadmium	mg/kg	6.92	12.2	17.2	10.3
Lead	mg/kg	1360	1570	3110	1470
Zinc	mg/kg	2010	3760	5320	2370
1 Percent Solid					
Solids, percent	%	84.2	81.7	88.0	80.6

Analysis/ Analyte	Units	21-__	22-__	23-__	24-__
1 Metals in Solids by ICP					
Arsenic	mg/kg	37.8	10.8	19.8	13.8
Barium	mg/kg	197	349	163	157
Cadmium	mg/kg	8.61	5.85	9.02	6.32
Lead	mg/kg	3070	1360	842	831
Zinc	mg/kg	2830	1110	2310	1710
1 Percent Solid					
Solids, percent	%	79.0	72.7	88.7	82.6

ASR Number: 3156 **RLAB Approved Sample Analysis Results** **12/04/2006**

Project ID: EMA78Q00 **Project Desc:** United Zinc No. 1 site sampling

Analysis/ Analyte	Units	25-__	26-__	27-__	28-__
1 Metals in Solids by ICP					
Arsenic	mg/kg	29.0	13.5	18.2	12.2
Barium	mg/kg	207	154	186	305
Cadmium	mg/kg	6.98	6.52	7.00	4.79
Lead	mg/kg	861	774	921	559
Zinc	mg/kg	1230	2010	1670	866
1 Percent Solid					
Solids, percent	%	84.4	83.8	84.0	76.7

ASR Number: 3156 **RLAB Approved Sample Analysis Results** **12/04/2006**

Project ID: EMA78Q00 **Project Desc:** United Zinc No. 1 site sampling

Analysis/ Analyte	Units	29-__	30-__	31-__	32-__
1 Metals in Solids by ICP					
Arsenic	mg/kg	98.2	13.6	12.7	90.0
Barium	mg/kg	192	231	189	228
Cadmium	mg/kg	11.6	7.65	5.16	9.18
Lead	mg/kg	2270	1050	396	2100
Zinc	mg/kg	3210	1480	1030	2460
1 Percent Solid					
Solids, percent	%	75.1	80.4	80.5	75.7

Project ID: EMA78Q00 **Project Desc:** United Zinc No. 1 site sampling

Analysis/ Analyte	Units	33-__	34-__	35-__	36-__
1 Metals in Solids by ICP					
Arsenic	mg/kg	15.9	14.0	9.97	10.2
Barium	mg/kg	189	219	171	155
Cadmium	mg/kg	9.12	6.30	11.3	7.32
Lead	mg/kg	825	599	503	374
Zinc	mg/kg	2310	978	1630	1320
1 Percent Solid					
Solids, percent	%	82.9	73.6	79.3	82.0

Project ID: EMA78Q00 **Project Desc:** United Zinc No. 1 site sampling

Analysis/ Analyte	Units	37-__
1 Metals in Solids by ICP		
Arsenic	mg/kg	10.6
Barium	mg/kg	145
Cadmium	mg/kg	6.11
Lead	mg/kg	529
Zinc	mg/kg	1250
1 Percent Solid		
Solids, percent	%	79.6

United States Environmental Protection Agency
Region VII
901 N. 5th Street
Kansas City, KS 66101

Date: __/__/____

Subject: Data Disposition/Sample Release for ASR #: 3156

Project ID: EMA78Q00

Project Description: United Zinc No. 1 site sampling

From: Eddie McGlasson
SUPR/ER&R

To: Kaye Dollmann
ENSV/RLAB/CATS

I have received and reviewed the Transmittal of Sample Analysis Results for the above-referenced Analytical Services Request(ASR) and have indicated my findings below by checking one of the boxes for Data Disposition.

☐ "RELEASED" - Read-only to all Region 7 employees and contractors that have R7LIMS "Customer" account.

☐ "Project Manager Accessible" - Available on the LAN in R7LIMS for my use only.

☐ "Archived" - THIS DATA IS OF A SENSITIVE NATURE. Any future reports must be requested through the laboratory.

I have determined that the samples need to be held until _____, after which time they will be disposed of in accordance with applicable regulations. I understand that if I do not specify a "hold until" date, the process for proper disposal of the samples will be initiated 30 days after the date on the data transmittal.

United States Environmental Protection Agency
Region 7
901 N. 5th Street
Kansas City, KS 66101

Date: 12/06/2006

Subject: Transmittal of Sample Analysis Results for ASR #: 3157

Project ID: EMA78Q00

Project Description: United Zinc No. 1 site sampling

From: Dale I. Bates, Director
Regional Laboratory, Environmental Services Division

To: Eddie McGlasson
SUPR/ER&R

Enclosed are the analytical data for the above-referenced Analytical Services Request (ASR) and Project. The Regional Laboratory has reviewed and verified the results in accordance with procedures described in our Quality Manual (QM). In addition to all of the analytical results, this transmittal contains pertinent information that may have influenced the reported results and documents any deviations from the established requirements of the QM.

Please contact us within 14 days of receipt of this package if you determine there is a need for any changes. Please complete the enclosed Customer Satisfaction Survey and Data Disposition/Sample Release memo for this ASR as soon as possible. The process of disposing of the samples for this ASR will be initiated 30 days from the date of this transmittal unless an alternate release date is specified on the Data Disposition/Sample Release memo.

If you have any questions or concerns relating to this data package, contact our customer service line at 913-551-5295.

Enclosures

cc: Analytical Data File.

Project Manager: Eddie McGlasson **Org:** SUPR/ER&R **Phone:** 913-551-7756
Project ID: EMA78Q00
Project Desc: United Zinc No. 1 site sampling
Location: Iola **State:** Kansas **Program:** Superfund
Site Name: United Zinc No. 1 - **Site ID:** A78Q **Site OU:** 00
Purpose: Site Characterization **GPRA PRC:** 302DC6C

Explanation of Codes, Units and Qualifiers used on this report

Sample QC Codes: QC Codes identify the type of sample for quality control purpose.

__ = Field Sample

Units: Specific units in which results are reported.

% = Percent
mg/kg = Milligrams per Kilogram

Data Qualifiers: Specific codes used in conjunction with data values to provide additional information on the quality of reported results, or used to explain the absence of a specific value.

(Blank)= Values have been reviewed and found acceptable for use.
J = The identification of the analyte is acceptable; the reported value is an estimate.
U = The analyte was not detected at or above the reporting limit.

ASR Number: 3157 **Sample Information Summary** **12/06/2006**

Project ID: EMA78Q00 **Project Desc:** United Zinc No. 1 site sampling

Sample No	QC Code	Matrix	Location Description	External Sample No	Start Date	Start Time	End Date	End Time	Receipt Date
1 -	__	Solid	EPA 525, Cell #4 (716 East Street)		10/30/2006	17:00			11/13/2006
2 -	__	Solid	EPA 526, Cell #2 (412 East Street)		10/30/2006	14:30			11/13/2006
3 -	__	Solid	EPA 480, Cell #2 (810 East Street)		10/31/2006	09:00			11/13/2006
4 -	__	Solid	EPA 544, Cell #1 (1002 East Street)		10/31/2006	10:50			11/13/2006
5 -	__	Solid	EPA 877, Cell #1 (124 East Jackson)		10/31/2006	16:45			11/13/2006
6 -	__	Solid	EPA 408, Cell #2 (324 South Oak)		10/31/2006	08:57			11/13/2006
7 -	__	Solid	EPA 883, Cell #2 (521 North Street)		11/01/2006	09:30			11/13/2006
8 -	__	Solid	EPA 844, Cell #2 (402 South Washington)		11/01/2006	13:00			11/13/2006
9 -	__	Solid	EPA 862, Cell #1 (210 South State)		11/01/2006	16:45			11/13/2006
10 -	__	Solid	EPA 833, Cell #1 (302 South Walnut)		11/02/2006	09:00			11/13/2006
11 -	__	Solid	EPA 792, Cell #3 (523 North Washington)		11/02/2006	14:00			11/13/2006
12 -	__	Solid	EPA 813, Cell #1 (702 North Walnut)		11/02/2006	16:00			11/13/2006
13 -	__	Solid	EPA 887, Cell #2 (322 North Walnut)		11/03/2006	11:10			11/13/2006
14 -	__	Solid	EPA 505, Cell #1 (904 North Chestnut)		11/06/2006	14:40			11/13/2006
15 -	__	Solid	EPA 611, Cell #3 (3 West Douglas)		11/06/2006	16:30			11/13/2006
16 -	__	Solid	EPA 668, Cell #2 (217 West Jackson)		11/07/2006	13:15			11/13/2006
17 -	__	Solid	EPA 907, Cell #1 (804 North Washington)		11/08/2006	11:00			11/13/2006
18 -	__	Solid	EPA 919, Cell #3 (624 North Washington)		11/09/2006	11:00			11/13/2006

Analysis	**Comments About Results For This Analysis**

1 Metals in Solids by ICP

Lab: Region 7 EPA Laboratory - Kansas City, Ks.

Method: EPA Region 7 RLAB Method 3122.3B

Samples: 1-__ 2-__ 3-__ 4-__ 5-__ 6-__ 7-__
8-__ 9-__ 10-__ 11-__ 12-__ 13-__ 14-__
15-__ 16-__ 17-__ 18-__

Comments:
Lead was J-coded in sample 1. Although the analyte in question has been positively identified in the sample, the quantitation is an estimate (J-coded) due to poor precision obtained for this analyte in the laboratory matrix spike and matrix spike duplicate.

1 Percent Solid

Lab: Region 7 EPA Laboratory - Kansas City, Ks.

Method: EPA Region 7 RLAB Method 3142.9D

Samples: 1-__ 2-__ 3-__ 4-__ 5-__ 6-__ 7-__
8-__ 9-__ 10-__ 11-__ 12-__ 13-__ 14-__
15-__ 16-__ 17-__ 18-__

Comments:
(N/A)

ASR Number: 3157 **RLAB Approved Sample Analysis Results** **12/06/2006**

Project ID: EMA78Q00 **Project Desc:** United Zinc No. 1 site sampling

Analysis/ Analyte	Units	1-__	2-__	3-__	4-__
1 Metals in Solids by ICP					
Arsenic	mg/kg	58.3	9.50	12.9	8.15
Barium	mg/kg	101	188	246	189
Cadmium	mg/kg	11.0	11.3	9.37	11.8
Lead	mg/kg	2040 J	662	824	726
Zinc	mg/kg	1340	1110	1390	1440
1 Percent Solid					
Solids, percent	%	77.1	80.7	76.5	73.1

Analysis/ Analyte	Units	5-__	6-__	7-__	8-__
1 Metals in Solids by ICP					
Arsenic	mg/kg	6.89 U	118	18.8	14.5
Barium	mg/kg	127	159	186	153
Cadmium	mg/kg	9.47	45.4	10.1	10.8
Lead	mg/kg	542	8390	871	748
Zinc	mg/kg	984	4560	1380	1270
1 Percent Solid					
Solids, percent	%	72.6	90.6	79.0	72.9

ASR Number: 3157 **RLAB Approved Sample Analysis Results** **12/06/2006**

Project ID: EMA78Q00 **Project Desc:** United Zinc No. 1 site sampling

Analysis/ Analyte	Units	9-__	10-__	11-__	12-__
1 Metals in Solids by ICP					
Arsenic	mg/kg	5.71	13.4	8.52	9.59
Barium	mg/kg	92.8	142	228	141
Cadmium	mg/kg	7.30	10.7	7.31	9.26
Lead	mg/kg	505	674	275	950
Zinc	mg/kg	659	1460	678	994
1 Percent Solid					
Solids, percent	%	80.0	77.1	79.4	80.2

Project ID: EMA78Q00 **Project Desc:** United Zinc No. 1 site sampling

Analysis/ Analyte	Units	13-__	14-__	15-__	16-__
1 Metals in Solids by ICP					
Arsenic	mg/kg	18.7	24.2	27.6	11.1
Barium	mg/kg	196	140	220	133
Cadmium	mg/kg	10.8	10.1	10.2	10.2
Lead	mg/kg	1120	1520	3980	665
Zinc	mg/kg	1680	1530	1330	1230
1 Percent Solid					
Solids, percent	%	82.7	77.9	81.1	82.7

Project ID: EMA78Q00 **Project Desc:** United Zinc No. 1 site sampling

Analysis/ Analyte	Units	17-__	18-__
1 Metals in Solids by ICP			
Arsenic	mg/kg	8.04	20.2
Barium	mg/kg	205	304
Cadmium	mg/kg	11.7	12.1
Lead	mg/kg	687	1320
Zinc	mg/kg	1650	1710
1 Percent Solid			
Solids, percent	%	81.0	80.7

United States Environmental Protection Agency
Region VII
901 N. 5th Street
Kansas City, KS 66101

Date: __/__/____

Subject: Data Disposition/Sample Release for ASR #: 3157

Project ID: EMA78Q00

Project Description: United Zinc No. 1 site sampling

From: Eddie McGlasson
SUPR/ER&R

To: Kaye Dollmann
ENSV/RLAB/CATS

I have received and reviewed the Transmittal of Sample Analysis Results for the above-referenced Analytical Services Request(ASR) and have indicated my findings below by checking one of the boxes for Data Disposition.

☐ "RELEASED" - Read-only to all Region 7 employees and contractors that have R7LIMS "Customer" account.

☐ "Project Manager Accessible" - Available on the LAN in R7LIMS for my use only.

☐ "Archived" - THIS DATA IS OF A SENSITIVE NATURE. Any future reports must be requested through the laboratory.

I have determined that the samples need to be held until _____, after which time they will be disposed of in accordance with applicable regulations. I understand that if I do not specify a "hold until" date, the process for proper disposal of the samples will be initiated 30 days after the date on the data transmittal.

United States Environmental Protection Agency
Region 7
901 N. 5th Street
Kansas City, KS 66101

Date: 12/19/2006

Subject: Transmittal of Sample Analysis Results for ASR #: 3158

Project ID: EMA78Q00

Project Description: United Zinc No. 1 site sampling

From: Dale I. Bates, Director
Regional Laboratory, Environmental Services Division

To: Eddie McGlasson
SUPR/ER&R

Enclosed are the analytical data for the above-referenced Analytical Services Request (ASR) and Project. The Regional Laboratory has reviewed and verified the results in accordance with procedures described in our Quality Manual (QM). In addition to all of the analytical results, this transmittal contains pertinent information that may have influenced the reported results and documents any deviations from the established requirements of the QM.

Please contact us within 14 days of receipt of this package if you determine there is a need for any changes. Please complete the enclosed Customer Satisfaction Survey and Data Disposition/Sample Release memo for this ASR as soon as possible. The process of disposing of the samples for this ASR will be initiated 30 days from the date of this transmittal unless an alternate release date is specified on the Data Disposition/Sample Release memo.

If you have any questions or concerns relating to this data package, contact our customer service line at 913-551-5295.

Enclosures

cc: Analytical Data File.

Project Manager: Eddie McGlasson **Org:** SUPR/ER&R **Phone:** 913-551-7756
Project ID: EMA78Q00
Project Desc: United Zinc No. 1 site sampling
Location: Iola **State:** Kansas **Program:** Superfund
Site Name: United Zinc No. 1 - **Site ID:** A78Q **Site OU:** 00
Purpose: Site Characterization **GPRA PRC:** 302DC6C

Explanation of Codes, Units and Qualifiers used on this report

Sample QC Codes: QC Codes identify the type of sample for quality control purpose.

__ = Field Sample

Units: Specific units in which results are reported.

% = Percent
mg/kg = Milligrams per Kilogram

Data Qualifiers: Specific codes used in conjunction with data values to provide additional information on the quality of reported results, or used to explain the absence of a specific value.

(Blank)= Values have been reviewed and found acceptable for use.
J = The identification of the analyte is acceptable; the reported value is an estimate.

ASR Number: 3158 **Sample Information Summary** **12/19/2006**

Project ID: EMA78Q00 **Project Desc:** United Zinc No. 1 site sampling

Sample No	QC Code	Matrix	Location Description	External Sample No	Start Date	Start Time	End Date	End Time	Receipt Date
1 -	__	Solid	EPA 927, Cell #2 (102 East Buchanan)		11/13/2006	14:00			12/08/2006
2 -	__	Solid	EPA 931, Cell #2 (208 South Cottonwood)		11/15/2006	14:30			12/08/2006
3 -	__	Solid	EPA 965, Cell #1 (318 North Colborn)		11/17/2006	09:30			12/08/2006
4 -	__	Solid	EPA 982, Cell #1 (215 North 3rd)		11/21/2006	11:00			12/08/2006
5 -	__	Solid	EPA 975, Cell #2 (414 North Jefferson)						12/08/2006
6 -	__	Solid	EPA 950, Cell #2 (115 South 3rd)		11/27/2006	14:33			12/08/2006
7 -	__	Solid	EPA 962, Cell #3 (516 South Walnut)		11/28/2006	11:11			12/08/2006
8 -	__	Solid	EPA 968, Cell #5 (311 North Elm)		11/27/2006	15:50			12/08/2006
9 -	__	Solid	EPA 957, Cell #3 (420 North Elm)		11/28/2006	10:00			12/08/2006
10 -	__	Solid	EPA 958, Cell #2 (512 North Elm)		11/28/2006	10:45			12/08/2006
11 -	__	Solid	EPA 998, Cell #1 (119 West Vine)		11/29/2006	10:00			12/08/2006

Analysis	Comments About Results For This Analysis

1 Metals in Solids by ICP

Lab: Region 7 EPA Laboratory - Kansas City, Ks.

Method: EPA Region 7 RLAB Method 3122.3B

Samples: 1-__ 2-__ 3-__ 4-__ 5-__ 6-__ 7-__
8-__ 9-__ 10-__ 11-__

Comments:
Cadmium was J-coded in all the samples. Although the analyte in question has been positively identified in the samples, the quantitation is an estimate (J-coded) due to high recovery of this analyte in the laboratory control sample. The actual concentration for this analyte may be lower than the reported value.

1 Percent Solid

Lab: Region 7 EPA Laboratory - Kansas City, Ks.

Method: EPA Region 7 RLAB Method 3142.9D

Samples: 1-__ 2-__ 3-__ 4-__ 5-__ 6-__ 7-__
8-__ 9-__ 10-__ 11-__

Comments:
(N/A)

ASR Number: 3158 **RLAB Approved Sample Analysis Results** **12/19/2006**

Project ID: EMA78Q00 **Project Desc:** United Zinc No. 1 site sampling

Analysis/ Analyte	Units	1-__	2-__	3-__	4-__
1 Metals in Solids by ICP					
Arsenic	mg/kg	34.4	14.5	9.49	13.4
Barium	mg/kg	237	230	175	164
Cadmium	mg/kg	10.3 J	8.79 J	7.05 J	7.35 J
Lead	mg/kg	2640	1260	426	483
Zinc	mg/kg	1520	1440	1110	1090
1 Percent Solid					
Solids, percent	%	77.8	80.4	82.1	85.9

ASR Number: 3158 **RLAB Approved Sample Analysis Results** **12/19/2006**

Project ID: EMA78Q00 **Project Desc:** United Zinc No. 1 site sampling

Analysis/ Analyte	Units	5-__	6-__	7-__	8-__
1 Metals in Solids by ICP					
Arsenic	mg/kg	19.5	15.2	8.10	18.3
Barium	mg/kg	250	171	165	219
Cadmium	mg/kg	13.1 J	9.33 J	5.00 J	12.7 J
Lead	mg/kg	1150	526	327	940
Zinc	mg/kg	2220	1490	523	1830
1 Percent Solid					
Solids, percent	%	85.3	75.5	76.7	78.3

ASR Number: 3158 **RLAB Approved Sample Analysis Results** **12/19/2006**

Project ID: EMA78Q00 **Project Desc:** United Zinc No. 1 site sampling

Analysis/ Analyte	Units	9-__	10-__	11-__
1 Metals in Solids by ICP				
Arsenic	mg/kg	23.4	145	27.4
Barium	mg/kg	286	247	159
Cadmium	mg/kg	11.8 J	28.2 J	9.98 J
Lead	mg/kg	1620	5550	961
Zinc	mg/kg	2270	4640	1730
1 Percent Solid				
Solids, percent	%	75.1	74.5	74.9

United States Environmental Protection Agency
Region VII
901 N. 5th Street
Kansas City, KS 66101

Date: __/__/____

Subject: Data Disposition/Sample Release for ASR #: 3158

Project ID: EMA78Q00

Project Description: United Zinc No. 1 site sampling

From: Eddie McGlasson
SUPR/ER&R

To: Kaye Dollmann
ENSV/RLAB/CATS

I have received and reviewed the Transmittal of Sample Analysis Results for the above-referenced Analytical Services Request(ASR) and have indicated my findings below by checking one of the boxes for Data Disposition.

☐ "RELEASED" - Read-only to all Region 7 employees and contractors that have R7LIMS "Customer" account.

☐ "Project Manager Accessible" - Available on the LAN in R7LIMS for my use only.

☐ "Archived" - THIS DATA IS OF A SENSITIVE NATURE. Any future reports must be requested through the laboratory.

I have determined that the samples need to be held until _____, after which time they will be disposed of in accordance with applicable regulations. I understand that if I do not specify a "hold until" date, the process for proper disposal of the samples will be initiated 30 days after the date on the data transmittal.

APPENDIX E

LEAD LABORTORY RESULTS FOR PA SOIL SAMPLES

EPA ID	Cell No.	Sample No.	Sample Date	Field XRF[1] (mg/kg)	Pre-lab XRF[2] (mg/kg)	Laboratory Results for Lead (mg/kg)	XRF ID
270	2	3151-1	8/16/2006	418	410	552	58
64	1	3151-2	8/16/2006	947	915	907	58
102	2	3151-3	8/16/2006	555	650	631	58
76	3	3151-4	8/16/2006	964	1,006	817	58
183	1	3151-5	8/16/2006	987	952	1,440	58
261	1	3151-6	8/16/2006	650	709	**805**	58
266	1	3151-7	8/16/2006	1,240	1,147	1,660	58
260	2	3151-8	8/16/2006	276	275	290	58
268	2	3151-9	8/16/2006	595	634	647	58
262	4	3151-10	8/16/2006	418	379	396	58
2	15	3151-11	8/16/2006	86	85	111	58
backfill		3151-12	8/16/2006	39	45	58	58
254	1	3152-1	8/21/2006	609	614	**946**	58
285	2	3152-2	8/21/2006	659	622	**991**	58
298	1	3152-3	8/22/2006	489	500	782	58
295	1	3152-4	8/22/2006	669	709	**1,200**	58
274	2	3152-5	8/16/2005	829	915	1,640	58
3	7	3152-6	8/16/2006	539	603	**838**	58
297	1	3152-7	8/23/2006	783	780	**1,140**	58
299	2	3152-8	8/24/2006	731	715	**1,130**	58
49	2	3152-9	8/24/2006	246	250	400	58
287	1	3152-10	8/25/2006	400	405	518	58
281	1	3152-11	8/28/2006	375	410	541	58
328	4	3152-12	8/29/2006	619	612	**1,050**	58
334	1	3152-13	8/29/2006	789	747	**1,050**	58
325	1	3152-14	8/30/2006	636	645	**1,010**	58
326	3	3152-15	8/30/2006	340	340	582	58
294	1	3152-16	8/30/2006	489	516	**996**	58
309	2	3152-17	8/30/2006	1,277	1,190	2,010	58
340	1	3152-18	8/30/2006	206	208	270	58
314	3	3152-19	8/31/2006	1,127	1,083	1,270	58
315	1	3152-20	8/31/2006	475	469	600	58
373	1	3153-1	9/6/2006	551	536	412	58
364	2	3153-2	9/7/2006	362	327	275	58
330	2	3153-3	9/8/2006	211	209	204	58
392	1	3153-4	9/11/2006	442	476	460	58
333	1	3153-5	9/11/2006	564	533	566	58
274	2	3153-6	9/11/2006	150	143	166	58
344	2	3153-7	9/12/2006	475	469	600	58
346	2	3153-8	9/12/2006	364	329	420	58

EPA ID	Cell No.	Sample No.	Sample Date	Field XRF[1] (mg/kg)	Pre-lab XRF[2] (mg/kg)	Laboratory Results for Lead (mg/kg)	XRF ID
389	3	3153-9	9/12/2006	232	221	296	58
356	1	3153-10	9/12/2006	422	444	484	58
255	1	3153-11	9/12/2006	813	729	738	58
354	2	3153-12	9/13/2006	380	397	406	58
41	3	3153-13	9/14/2006	1,223	1,287	1,690	58
394	1	3153-14	9/14/2006	556	530	523	58
337	3	3153-15	9/14/2006	710	747	699	58
378	2	3153-16	9/15/2006	633	742	**1,050**	58
341	1	3153-17	9/15/2006	532	527	515	58
444	1	3154-1	9/18/2006	211	233	329	58
414	4	3154-2	9/18/2006	475	473	592	58
408	3	3154-3	9/19/2006	450	443	635	62
396	1	3154-4	9/19/2006	380	361	509	58
435	2	3154-5	9/21/2006	167	154	255	58
558	2	3154-6	9/25/2006	430	474	443	62
65	2	3154-7	9/25/2006	521	1,007	1,480	62
541	2	3154-8	9/25/2006	571	506	568	ER-51
411	1	3154-9	9/27/2006	846	827	1,280	ER-51
397	3	3154-10	9/19/2006	750	780	**1,390**	62
452	5	3154-11	9/20/2006	830	689	1,380	62
467	4	3154-12	9/20/2006	551	553	**857**	62
467	2	3154-13	9/20/2006	850	769	1,040	62
434	1	3154-14	9/21/2006	579	589	**916**	58
463	2	3154-15	9/21/2006	466	421	**1,140**	58
404	1	3154-16	9/21/2006	435	490	748	58
433	1	3154-17	9/21/2006	533	520	719	58
406	1	3154-18	9/21/2006	346	316	449	58
431	3	3154-19	9/25/2006	141	217	380	62
416	3	3154-20	9/25/2006	166	195	264	62
458	3	3154-21	9/26/2006	168	195	232	62
547	4	3154-22	9/26/2006	467	443	581	62
387	3	3154-23	9/26/2006	304	304	461	62
524	3	3154-24	9/26/2006	160	110	189	62
565	1	3154-25	9/26/2006	707	802	1,410	62
579	2	3154-26	9/27/2006	1,113	1,180	1,500	62
579	4	3154-27	9/27/2006	625	544	**839**	62
567	5	3154-28	9/27/2006	616	526	**1,190**	62
554	3	3154-29	9/27/2006	720	769	**916**	62
588	1	3154-30	9/28/2006	630	695	**970**	62
588	3	3154-31	9/28/2006	818	900	1,690	62

EPA ID	Cell No.	Sample No.	Sample Date	Field XRF[1] (mg/kg)	Pre-lab XRF[2] (mg/kg)	Laboratory Results for Lead (mg/kg)	XRF ID
593	1	3154-32	9/28/2006	1,140	1,120	2,520	62
591	2	3154-33	9/28/2006	583	793	**1,230**	62
468	2	3154-34	9/28/2006	717		**1,010**	ER-51
532	2	3154-35	9/29/2006	624	763	**1,920**	62
531	2	3155-1	10/2/2006	409	258	337	62
505	2	3155-2	10/3/2006	293	306	397	62
515	1	3155-3	10/3/2006	479	378	683	62
514	1	3155-4	10/3/2006	683	338	**908**	62
625	1	3155-5	10/4/2006	493	547	**993**	ER-51
234	3	3155-6	10/4/2006	648	467	796	ER-51
486	2	3155-7	10/4/2006	176	211	117	62
610	1	3155-8	10/4/2006	552	692	676	62
607	1	3155-9	10/4/2006	1,103	1,250	1,410	62
659	1	3155-10	10/5/2006	425	399	785	ER-51
234	2	3155-11	10/5/2006	2,403	2,839	6,430	ER-51
601		3155-12	10/5/2006	935	848	1,060	62
664	1	3155-13	10/5/2006	735	694	759	62
662	3	3155-14	10/5/2006	1,143	1,127	1,250	62
621	1	3155-15	10/6/2006	1,213	1,287	1,870	62
553	6	3155-16	10/6/2006	417	376	507	62
658	1	3155-17	10/9/2006	1,500	1,410	3,810	62
720	1	3155-18	10/10/2006	416	465	701	ER-51
710	5	3155-19	10/10/2006	656	616	789	62
683	4	3155-20	10/11/2006	117	110	176	62
685	3	3155-21	10/11/2006	123	105	196	ER-51
672	5	3155-22	10/11/2006	141	143	228	ER-51
688	1	3155-23		117	179	297	ER-51
676	2	3155-24	10/11/2006	137	168	228	ER-51
366	1	3155-25	10/11/2006	226	256	380	ER-51
725	1	3155-26	10/12/2006	268	280	482	62
717	1	3155-27	10/12/2006	436	428	764	ER-51
679	4	3155-28	10/12/2006	181	130	225	ER-51
680	1	3155-29	10/12/2006	152	220	359	ER-51
703	3	3155-30	10/12/2006	229	253	397	ER-51
694	1	3155-31	10/12/2006	308	297	521	ER-51
635	2	3155-32	10/13/2006	175	187	241	62
699	2	3155-33	10/13/2006	482	469	794	ER-51
729	1	3156-1	10/16/2006	317	365	731	ER-51
771	3	3156-2	10/16/2006	1,633	1,420	3,620	62
748	1	3156-3	10/16/2006	281	245	458	62

EPA ID	Cell No.	Sample No.	Sample Date	Field XRF[1] (mg/kg)	Pre-lab XRF[2] (mg/kg)	Laboratory Results for Lead (mg/kg)	XRF ID
739	2	3156-4	10/16/2006	525	607	**1,260**	62
755	4	3156-5	10/17/2006	647	717	**1,230**	57
745	4	3156-6	10/17/2006	231	247	374	62
746	1	3156-7	10/17/2006	298	290	588	62
753	1	3156-8	10/17/2006	383	365	680	62
617	3	3156-9	10/17/2006	167	150	265	62
775	2	3156-10	10/17/2006	856	923	1,410	62
621	4	3156-11	10/18/2006	274	282	466	57
781	1	3156-12	10/18/2006	311	302	515	57
647	4	3156-13	10/18/2006	220	277	420	62
632	3	3156-14	10/18/2006	298	331	746	62
648	2	3156-15	10/18/2006	807	759	1,360	62
651	3	3156-16	10/18/2006	888	956	1,780	62
589	4	3156-17	10/18/2006	703	807	1,360	62
759	4	3156-18	10/19/2006	741	829	1,570	62
443	1	3156-19	10/19/2006	1,150	1,084	3,110	62
692	1	3156-20	10/19/2006	788	751	**1,470**	62
613	4	3156-21	10/19/2006	1,386	1,370	3,070	62
400	4	3156-22	10/19/2006	488	602	**1,360**	62
621	2	3156-23	10/19/2006	569	509	**842**	57
793	3	3156-24	10/20/2006	469	404	**831**	62
750	1	3156-25	10/19/2006	464	492	**861**	57
810	4	3156-26	10/20/2006	457	451	774	62
446	3	3156-27	10/20/2006	526	485	**921**	57
764	2	3156-28	10/23/2006	245	253	559	57
417	1	3156-29	10/24/2006	794	896	2,270	57
796	1	3156-30	10/24/2006	521	468	**1,050**	57
805	1	3156-31	10/24/2006	270	228	396	62
806	1	3156-32	10/24/2006	1,070	902	2,100	62
787	1	3156-33	10/24/2006	475	507	**825**	62
786	1	3156-34	10/25/2006	276	286	599	57
500	2	3156-35	10/25/2006	268	305	503	57
509	1	3156-36	10/25/2006	223	217	374	57
853	1	3156-37	10/26/2006	232	271	529	62
525	4	3157-1	10/30/2006	703	801	2040 J	57
526	2	3157-2	10/30/2006	442	447	662	57
480	2	3157-3	10/31/2006	510	525	824	57
544	2	3157-4	10/31/2006	468	478	726	57
877	1	3157-5	10/31/2006	352	417	542	57
408	2	3157-6	10/31/2006	6,157	6,342	8,390	62

Soil Sample Data United Zinc Removal/Assessment Activities

EPA ID	Cell No.	Sample No.	Sample Date	Field XRF[1] (mg/kg)	Pre-lab XRF[2] (mg/kg)	Laboratory Results for Lead (mg/kg)	XRF ID
883	2	3157-7	11/1/2006	653	619	**871**	57
844	2	3157-8	11/1/2006	538	522	748	57
862	1	3157-9	11/1/2006	279	260	505	57
833	1	3157-10	11/2/2006	485	469	674	57
792	3	3157-11	11/2/2006	252	267	275	57
813	1	3157-12	11/2/2006	327	351	**950**	57
887	2	3157-13	11/3/2006	756	768	**1,120**	57
606	1	3157-14	11/6/2006	953	1,107	1,520	57
611	3	3157-15	11/6/2006	602	564	**3,980**	57
668	2	3157-16	11/7/2006	447	455	665	62
907	1	3157-17	11/8/2006	469	466	687	57
919	3	3157-18	11/9/2006	825	691	1,320	57
927	2	3158-1	11/13/2006	1,190	1,260	2,640	57
931	2	3158-2	11/15/2006	787	761	**1,260**	62
965	1	3158-3	11/17/2006	312	325	426	62
982	1	3158-4	11/21/2006	334	330	483	ER-51
975	2	3158-5	11/21/2006	643	580	**1,150**	ER-51
950	2	3158-6	11/27/2006	345	373	526	62
962	3	3158-7	11/28/2006	252	225	327	62
968	5	3158-8	11/27/2006	446	517	**940**	ER-51
957	3	3158-9	11/28/2006	811	550	1,620	ER-51
958	2	3158-10	11/28/2006	1,002	1,397	5,550	ER-51
998	2	3158-11	11/29/2006	642	605	**961**	62

Notes

The **bold** values indicate laboratory results that are greater than the 800 mg/kg action level, but the XRF readings were less than the action level

The highlighted values identify laboratory results that exceed the action level of 800 mg/kg

Field XRF[1]	The average of the initial three XRF readings after the multi-aliquot soil sample was homogenized
ID	Identification
mg/kg	Milligrams/kilogram
No	Number
Pre-lab XRF[2]	The average of three XRF readings obrained from a smaller portion of the field sample that was sent to the laboratory for confirmatory analyses

Memo From: Barry Evans, EPA
Telephone: (913) 551-5144

Reference 13

HRS Analysis Results Supplement

03/27/2007

ASR Number: 3155

This report supplements the information contained in the Transmittal of Sample Analysis Results for ASR 3155 sent to Eddie McGlasson on 11/09/2006 for: EMA78Q00 - United Zinc No. 1 site sampling. The transmittal contains the explanation of codes, units, and qualifiers; sample information; analysis information and comments; and the analytical results. The RL in this supplement is the laboratory's reporting limit for that analyte with any dilution factor, volume adjustment, or percent solids for that sample analysis taken into account and is sometimes called the sample quantitation limit, SQL.

Sample	Analysis / Analyte		Units	Result	RL
1-__	1	Metals in Solids by ICP			
		Arsenic	mg/kg	10.7	4.88
		Barium	mg/kg	232	1.95
		Cadmium	mg/kg	6.04	0.98
		Lead	mg/kg	337 J	4.88
		Zinc	mg/kg	792	4.88
1-__	1	Percent Solid			
		Solids, percent	%	94.9	
2-__	1	Metals in Solids by ICP			
		Arsenic	mg/kg	16.8	5.08
		Barium	mg/kg	276	2.03
		Cadmium	mg/kg	6.09	1.02
		Lead	mg/kg	397	5.08
		Zinc	mg/kg	1020	5.08
2-__	1	Percent Solid			
		Solids, percent	%	95.6	
3-__	1	Metals in Solids by ICP			
		Arsenic	mg/kg	23.1	4.95
		Barium	mg/kg	191	1.98
		Cadmium	mg/kg	9.67	0.99
		Lead	mg/kg	683	4.95
		Zinc	mg/kg	2250	4.95
3-__	1	Percent Solid			
		Solids, percent	%	96.3	
4-__	1	Metals in Solids by ICP			
		Arsenic	mg/kg	20.1	5.28
		Barium	mg/kg	157	2.11
		Cadmium	mg/kg	6.86	1.06
		Lead	mg/kg	908	5.28
		Zinc	mg/kg	1640	5.28
4-__	1	Percent Solid			
		Solids, percent	%	91.9	

ASR Number: 3155 **HRS Analysis Results Supplement** 03/27/2007

Sample	Analysis / Analyte		Units	Result	RL
5-__	1	Metals in Solids by ICP			
		Arsenic	mg/kg	14.1	5.60
		Barium	mg/kg	155	2.24
		Cadmium	mg/kg	8.61	1.12
		Lead	mg/kg	993	5.60
		Zinc	mg/kg	1930	5.60
5-__	1	Percent Solid			
		Solids, percent	%	86.7	
6-__	1	Metals in Solids by ICP			
		Arsenic	mg/kg	42.4	5.22
		Barium	mg/kg	395	2.09
		Cadmium	mg/kg	14.9	1.04
		Lead	mg/kg	796	5.22
		Zinc	mg/kg	4210	5.22
6-__	1	Percent Solid			
		Solids, percent	%	91.2	
7-__	1	Metals in Solids by ICP			
		Arsenic	mg/kg	8.60	4.68
		Barium	mg/kg	221	1.87
		Cadmium	mg/kg	7.63	0.94
		Lead	mg/kg	117	4.68
		Zinc	mg/kg	435	4.68
7-__	1	Percent Solid			
		Solids, percent	%	94.5	
8-__	1	Metals in Solids by ICP			
		Arsenic	mg/kg	8.11	5.37
		Barium	mg/kg	156	2.15
		Cadmium	mg/kg	9.34	1.07
		Lead	mg/kg	676	5.37
		Zinc	mg/kg	1820	5.37
8-__	1	Percent Solid			
		Solids, percent	%	88.7	
9-__	1	Metals in Solids by ICP			
		Arsenic	mg/kg	21.8	5.20
		Barium	mg/kg	127	2.08
		Cadmium	mg/kg	10.8	1.04
		Lead	mg/kg	1410	5.20
		Zinc	mg/kg	2720	5.20
9-__	1	Percent Solid			
		Solids, percent	%	92.5	
10-__	1	Metals in Solids by ICP			
		Arsenic	mg/kg	11.5	5.39

ASR Number: 3155 **HRS Analysis Results Supplement** 03/27/2007

Sample	Analysis / Analyte		Units	Result	RL
10-__	1	Metals in Solids by ICP			
		Barium	mg/kg	227	2.16
		Cadmium	mg/kg	11.2	1.08
		Lead	mg/kg	785	5.39
		Zinc	mg/kg	2070	5.39
10-__	1	Percent Solid			
		Solids, percent	%	90.1	
11-__	1	Metals in Solids by ICP			
		Arsenic	mg/kg	125	5.40
		Barium	mg/kg	223	2.16
		Cadmium	mg/kg	22.2	1.08
		Lead	mg/kg	6430	5.40
		Zinc	mg/kg	7990	5.40
11-__	1	Percent Solid			
		Solids, percent	%	92.6	
12-__	1	Metals in Solids by ICP			
		Arsenic	mg/kg	19.3	4.99
		Barium	mg/kg	152	1.99
		Cadmium	mg/kg	11.5	1.00
		Lead	mg/kg	1060	4.99
		Zinc	mg/kg	3150	4.99
12-__	1	Percent Solid			
		Solids, percent	%	92.0	
13-__	1	Metals in Solids by ICP			
		Arsenic	mg/kg	10.4	5.25
		Barium	mg/kg	121	2.10
		Cadmium	mg/kg	8.69	1.05
		Lead	mg/kg	759	5.25
		Zinc	mg/kg	1620	5.25
13-__	1	Percent Solid			
		Solids, percent	%	93.3	
14-__	1	Metals in Solids by ICP			
		Arsenic	mg/kg	17.2	5.23
		Barium	mg/kg	133	2.09
		Cadmium	mg/kg	11.2	1.05
		Lead	mg/kg	1250	5.23
		Zinc	mg/kg	2580	5.23
14-__	1	Percent Solid			
		Solids, percent	%	93.8	
15-__	1	Metals in Solids by ICP			
		Arsenic	mg/kg	10.5	5.04
		Barium	mg/kg	95.1	2.02

ASR Number: 3155 **HRS Analysis Results Supplement** 03/27/2007

Sample	Analysis / Analyte		Units	Result	RL
15-__	1	Metals in Solids by ICP			
		Cadmium	mg/kg	11.1	1.01
		Lead	mg/kg	1870	5.04
		Zinc	mg/kg	1870	5.04
15-__	1	Percent Solid			
		Solids, percent	%	94.5	
16-__	1	Metals in Solids by ICP			
		Arsenic	mg/kg	8.89	5.48
		Barium	mg/kg	149	2.19
		Cadmium	mg/kg	6.96	1.10
		Lead	mg/kg	507	5.48
		Zinc	mg/kg	930	5.48
16-__	1	Percent Solid			
		Solids, percent	%	89.6	
17-__	1	Metals in Solids by ICP			
		Arsenic	mg/kg	130	5.30
		Barium	mg/kg	197	2.12
		Cadmium	mg/kg	12.0	1.06
		Lead	mg/kg	3810	5.30
		Zinc	mg/kg	3220	5.30
17-__	1	Percent Solid			
		Solids, percent	%	92.5	
18-__	1	Metals in Solids by ICP			
		Arsenic	mg/kg	13.1	5.46
		Barium	mg/kg	140	2.18
		Cadmium	mg/kg	8.27	1.09
		Lead	mg/kg	701	5.46
		Zinc	mg/kg	1680	5.46
18-__	1	Percent Solid			
		Solids, percent	%	89.8	
19-__	1	Metals in Solids by ICP			
		Arsenic	mg/kg	13.4	5.71
		Barium	mg/kg	168	2.28
		Cadmium	mg/kg	10.3	1.14
		Lead	mg/kg	789	5.71
		Zinc	mg/kg	2480	5.71
19-__	1	Percent Solid			
		Solids, percent	%	85.9	
20-__	1	Metals in Solids by ICP			
		Arsenic	mg/kg	8.01	6.77
		Barium	mg/kg	197	2.71
		Cadmium	mg/kg	8.98	1.35

ASR Number: 3155 **HRS Analysis Results Supplement** 03/27/2007

Sample	Analysis / Analyte		Units	Result	RL
20-__	1	Metals in Solids by ICP			
		Lead	mg/kg	176	6.77
		Zinc	mg/kg	822	6.77
20-__	1	Percent Solid			
		Solids, percent	%	71.0	
21-__	1	Metals in Solids by ICP			
		Arsenic	mg/kg	7.51	6.50
		Barium	mg/kg	117	2.60
		Cadmium	mg/kg	8.91	1.30
		Lead	mg/kg	196	6.50
		Zinc	mg/kg	823	6.50
21-__	1	Percent Solid			
		Solids, percent	%	71.9	
22-__	1	Metals in Solids by ICP			
		Arsenic	mg/kg	7.94	6.51
		Barium	mg/kg	151	2.61
		Cadmium	mg/kg	10.7	1.30
		Lead	mg/kg	228	6.51
		Zinc	mg/kg	1050	6.51
22-__	1	Percent Solid			
		Solids, percent	%	74.5	
23-__	1	Metals in Solids by ICP			
		Arsenic	mg/kg	7.77	6.24
		Barium	mg/kg	143	2.49
		Cadmium	mg/kg	8.81	1.25
		Lead	mg/kg	297	6.24
		Zinc	mg/kg	936	6.24
23-__	1	Percent Solid			
		Solids, percent	%	78.6	
24-__	1	Metals in Solids by ICP			
		Arsenic	mg/kg	12.6	6.05
		Barium	mg/kg	182	2.42
		Cadmium	mg/kg	8.37	1.21
		Lead	mg/kg	228	6.05
		Zinc	mg/kg	846	6.05
24-__	1	Percent Solid			
		Solids, percent	%	77.9	
25-__	1	Metals in Solids by ICP			
		Arsenic	mg/kg	13.0	5.75
		Barium	mg/kg	435	2.30
		Cadmium	mg/kg	7.65	1.15
		Lead	mg/kg	380	5.75

ASR Number: 3155 **HRS Analysis Results Supplement** 03/27/2007

Sample	Analysis / Analyte		Units	Result	RL
25-__	1	Metals in Solids by ICP			
		Zinc	mg/kg	778	5.75
25-__	1	Percent Solid			
		Solids, percent	%	84.4	
26-__	1	Metals in Solids by ICP			
		Arsenic	mg/kg	10.1	5.94
		Barium	mg/kg	160	2.38
		Cadmium	mg/kg	9.16	1.19
		Lead	mg/kg	482	5.94
		Zinc	mg/kg	1890	5.94
26-__	1	Percent Solid			
		Solids, percent	%	80.1	
27-__	1	Metals in Solids by ICP			
		Arsenic	mg/kg	16.8	6.23
		Barium	mg/kg	140	2.49
		Cadmium	mg/kg	10.4	1.25
		Lead	mg/kg	764	6.23
		Zinc	mg/kg	2370	6.23
27-__	1	Percent Solid			
		Solids, percent	%	76.4	
28-__	1	Metals in Solids by ICP			
		Arsenic	mg/kg	8.05	5.72
		Barium	mg/kg	129	2.29
		Cadmium	mg/kg	7.53	1.14
		Lead	mg/kg	225	5.72
		Zinc	mg/kg	855	5.72
28-__	1	Percent Solid			
		Solids, percent	%	84.1	
29-__	1	Metals in Solids by ICP			
		Arsenic	mg/kg	10.3	6.14
		Barium	mg/kg	173	2.46
		Cadmium	mg/kg	11.5	1.23
		Lead	mg/kg	359	6.14
		Zinc	mg/kg	1370	6.14
29-__	1	Percent Solid			
		Solids, percent	%	77.5	
30-__	1	Metals in Solids by ICP			
		Arsenic	mg/kg	9.76	5.83
		Barium	mg/kg	160	2.33
		Cadmium	mg/kg	8.89	1.17
		Lead	mg/kg	397	5.83
		Zinc	mg/kg	1400	5.83

ASR Number: 3155 **HRS Analysis Results Supplement** 03/27/2007

Sample	Analysis / Analyte		Units	Result	RL
30-__	1	Percent Solid			
		Solids, percent	%	82.5	
31-__	1	Metals in Solids by ICP			
		Arsenic	mg/kg	15.1	5.92
		Barium	mg/kg	121	2.37
		Cadmium	mg/kg	6.96	1.18
		Lead	mg/kg	521	5.92
		Zinc	mg/kg	1100	5.92
31-__	1	Percent Solid			
		Solids, percent	%	82.9	
32-__	1	Metals in Solids by ICP			
		Arsenic	mg/kg	9.26	6.13
		Barium	mg/kg	165	2.45
		Cadmium	mg/kg	7.17	1.23
		Lead	mg/kg	241	6.13
		Zinc	mg/kg	679	6.13
32-__	1	Percent Solid			
		Solids, percent	%	77.7	
33-__	1	Metals in Solids by ICP			
		Arsenic	mg/kg	13.1	5.64
		Barium	mg/kg	161	2.25
		Cadmium	mg/kg	8.20	1.13
		Lead	mg/kg	794	5.64
		Zinc	mg/kg	1550	5.64
33-__	1	Percent Solid			
		Solids, percent	%	83.7	

HRS Analysis Results Supplement

03/27/2007

ASR Number: 3156

This report supplements the information contained in the Transmittal of Sample Analysis Results for ASR 3156 sent to Eddie McGlasson on 12/04/2006 for: EMA78Q00 - United Zinc No. 1 site sampling. The transmittal contains the explanation of codes, units, and qualifiers; sample information; analysis information and comments; and the analytical results. The RL in this supplement is the laboratory's reporting limit for that analyte with any dilution factor, volume adjustment, or percent solids for that sample analysis taken into account and is sometimes called the sample quantitation limit, SQL.

Sample	Analysis / Analyte		Units	Result	RL
1-__	1	Metals in Solids by ICP			
		Arsenic	mg/kg	14.6	5.77
		Barium	mg/kg	295	2.31
		Cadmium	mg/kg	7.05	1.15
		Lead	mg/kg	731	5.77
		Zinc	mg/kg	1410	5.77
1-__	1	Percent Solid			
		Solids, percent	%	83.3	
2-__	1	Metals in Solids by ICP			
		Arsenic	mg/kg	28.0	6.05
		Barium	mg/kg	206	2.42
		Cadmium	mg/kg	6.26	1.21
		Lead	mg/kg	3620	6.05
		Zinc	mg/kg	1960	6.05
2-__	1	Percent Solid			
		Solids, percent	%	82.7	
3-__	1	Metals in Solids by ICP			
		Arsenic	mg/kg	18.6	6.84
		Barium	mg/kg	161	2.74
		Cadmium	mg/kg	4.88	1.37
		Lead	mg/kg	458	6.84
		Zinc	mg/kg	865	6.84
3-__	1	Percent Solid			
		Solids, percent	%	73.1	
4-__	1	Metals in Solids by ICP			
		Arsenic	mg/kg	36.4	6.78
		Barium	mg/kg	363	2.71
		Cadmium	mg/kg	9.38	1.36
		Lead	mg/kg	1260	6.78
		Zinc	mg/kg	2440	6.78
4-__	1	Percent Solid			
		Solids, percent	%	72.3	

ASR Number: 3156 **HRS Analysis Results Supplement** 03/27/2007

Sample	Analysis / Analyte		Units	Result	RL
5-__	1	Metals in Solids by ICP			
		Arsenic	mg/kg	37.8	5.92
		Barium	mg/kg	256	2.37
		Cadmium	mg/kg	6.26	1.18
		Lead	mg/kg	1230	5.92
		Zinc	mg/kg	1860	5.92
5-__	1	Percent Solid			
		Solids, percent	%	78.9	
6-__	1	Metals in Solids by ICP			
		Arsenic	mg/kg	8.49	5.91
		Barium	mg/kg	145	2.36
		Cadmium	mg/kg	5.45	1.18
		Lead	mg/kg	374	5.91
		Zinc	mg/kg	1100	5.91
6-__	1	Percent Solid			
		Solids, percent	%	82.9	
7-__	1	Metals in Solids by ICP			
		Arsenic	mg/kg	12.0	5.90
		Barium	mg/kg	157	2.36
		Cadmium	mg/kg	7.68	1.18
		Lead	mg/kg	588	5.90
		Zinc	mg/kg	1580	5.90
7-__	1	Percent Solid			
		Solids, percent	%	76.3	
8-__	1	Metals in Solids by ICP			
		Arsenic	mg/kg	11.6	6.16
		Barium	mg/kg	354	2.46
		Cadmium	mg/kg	5.75	1.23
		Lead	mg/kg	680	6.16
		Zinc	mg/kg	1320	6.16
8-__	1	Percent Solid			
		Solids, percent	%	75.9	
9-__	1	Metals in Solids by ICP			
		Arsenic	mg/kg	6.88	5.71
		Barium	mg/kg	197	2.28
		Cadmium	mg/kg	4.27	1.14
		Lead	mg/kg	265	5.71
		Zinc	mg/kg	1050	5.71
9-__	1	Percent Solid			
		Solids, percent	%	84.2	
10-__	1	Metals in Solids by ICP			
		Arsenic	mg/kg	21.3	5.89

Page 2 of 8

ASR Number: 3156 **HRS Analysis Results Supplement** 03/27/2007

Sample	Analysis / Analyte		Units	Result	RL
10-__	1	Metals in Solids by ICP			
		Barium	mg/kg	389	2.35
		Cadmium	mg/kg	9.26	1.18
		Lead	mg/kg	1410	5.89
		Zinc	mg/kg	1910	5.89
10-__	1	Percent Solid			
		Solids, percent	%	85.0	
11-__	1	Metals in Solids by ICP			
		Arsenic	mg/kg	11.8	5.28
		Barium	mg/kg	271	2.11
		Cadmium	mg/kg	6.17	1.06
		Lead	mg/kg	466	5.28
		Zinc	mg/kg	1250	5.28
11-__	1	Percent Solid			
		Solids, percent	%	86.9	
12-__	1	Metals in Solids by ICP			
		Arsenic	mg/kg	9.96	6.23
		Barium	mg/kg	214	2.49
		Cadmium	mg/kg	7.30	1.25
		Lead	mg/kg	515	6.23
		Zinc	mg/kg	1610	6.23
12-__	1	Percent Solid			
		Solids, percent	%	77.9	
13-__	1	Metals in Solids by ICP			
		Arsenic	mg/kg	10.9	6.45
		Barium	mg/kg	199	2.58
		Cadmium	mg/kg	7.46	1.29
		Lead	mg/kg	420	6.45
		Zinc	mg/kg	1820	6.45
13-__	1	Percent Solid			
		Solids, percent	%	76.0	
14-__	1	Metals in Solids by ICP			
		Arsenic	mg/kg	20.1	5.89
		Barium	mg/kg	243	2.35
		Cadmium	mg/kg	6.35	1.18
		Lead	mg/kg	746	5.89
		Zinc	mg/kg	1390	5.89
14-__	1	Percent Solid			
		Solids, percent	%	80.9	
15-__	1	Metals in Solids by ICP			
		Arsenic	mg/kg	21.3	6.13
		Barium	mg/kg	355	2.45

Page 3 of 8

ASR Number: 3156 **HRS Analysis Results Supplement** 03/27/2007

Sample	Analysis / Analyte		Units	Result	RL
15-__	1	Metals in Solids by ICP			
		Cadmium	mg/kg	9.60	1.23
		Lead	mg/kg	1360	6.13
		Zinc	mg/kg	2750	6.13
15-__	1	Percent Solid			
		Solids, percent	%	80.7	
16-__	1	Metals in Solids by ICP			
		Arsenic	mg/kg	35.7	6.42
		Barium	mg/kg	290	2.57
		Cadmium	mg/kg	16.6	1.28
		Lead	mg/kg	1780	6.42
		Zinc	mg/kg	2420	6.42
16-__	1	Percent Solid			
		Solids, percent	%	77.1	
17-__	1	Metals in Solids by ICP			
		Arsenic	mg/kg	17.6	5.60
		Barium	mg/kg	206	2.24
		Cadmium	mg/kg	6.92	1.12
		Lead	mg/kg	1360	5.60
		Zinc	mg/kg	2010	5.60
17-__	1	Percent Solid			
		Solids, percent	%	84.2	
18-__	1	Metals in Solids by ICP			
		Arsenic	mg/kg	33.9	5.83
		Barium	mg/kg	233	2.33
		Cadmium	mg/kg	12.2	1.17
		Lead	mg/kg	1570	5.83
		Zinc	mg/kg	3760	5.83
18-__	1	Percent Solid			
		Solids, percent	%	81.7	
19-__	1	Metals in Solids by ICP			
		Arsenic	mg/kg	178	5.63
		Barium	mg/kg	190	2.25
		Cadmium	mg/kg	17.2	1.13
		Lead	mg/kg	3110	5.63
		Zinc	mg/kg	5320	5.63
19-__	1	Percent Solid			
		Solids, percent	%	88.0	
20-__	1	Metals in Solids by ICP			
		Arsenic	mg/kg	42.3	5.85
		Barium	mg/kg	156	2.34
		Cadmium	mg/kg	10.3	1.17

Page 4 of 8

ASR Number: 3156 **HRS Analysis Results Supplement** 03/27/2007

Sample	Analysis / Analyte		Units	Result	RL
20-__	1	Metals in Solids by ICP			
		Lead	mg/kg	1470	5.85
		Zinc	mg/kg	2370	5.85
20-__	1	Percent Solid			
		Solids, percent	%	80.6	
21-__	1	Metals in Solids by ICP			
		Arsenic	mg/kg	37.8	5.75
		Barium	mg/kg	197	2.30
		Cadmium	mg/kg	8.61	1.15
		Lead	mg/kg	3070	5.75
		Zinc	mg/kg	2830	5.75
21-__	1	Percent Solid			
		Solids, percent	%	79.0	
22-__	1	Metals in Solids by ICP			
		Arsenic	mg/kg	10.8	6.68
		Barium	mg/kg	349	2.67
		Cadmium	mg/kg	5.85	1.34
		Lead	mg/kg	1360	6.68
		Zinc	mg/kg	1110	6.68
22-__	1	Percent Solid			
		Solids, percent	%	72.7	
23-__	1	Metals in Solids by ICP			
		Arsenic	mg/kg	19.8	5.22
		Barium	mg/kg	163	2.09
		Cadmium	mg/kg	9.02	1.04
		Lead	mg/kg	842	5.22
		Zinc	mg/kg	2310	5.22
23-__	1	Percent Solid			
		Solids, percent	%	88.7	
24-__	1	Metals in Solids by ICP			
		Arsenic	mg/kg	13.8	5.66
		Barium	mg/kg	157	2.26
		Cadmium	mg/kg	6.32	1.13
		Lead	mg/kg	831	5.66
		Zinc	mg/kg	1710	5.66
24-__	1	Percent Solid			
		Solids, percent	%	82.6	
25-__	1	Metals in Solids by ICP			
		Arsenic	mg/kg	29.0	5.87
		Barium	mg/kg	207	2.35
		Cadmium	mg/kg	6.98	1.17
		Lead	mg/kg	861	5.87

ASR Number: 3156 **HRS Analysis Results Supplement** 03/27/2007

Sample	Analysis / Analyte		Units	Result	RL
25-__	1	Metals in Solids by ICP			
		Zinc	mg/kg	1230	5.87
25-__	1	Percent Solid			
		Solids, percent	%	84.4	
26-__	1	Metals in Solids by ICP			
		Arsenic	mg/kg	13.5	5.79
		Barium	mg/kg	154	2.32
		Cadmium	mg/kg	6.52	1.16
		Lead	mg/kg	774	5.79
		Zinc	mg/kg	2010	5.79
26-__	1	Percent Solid			
		Solids, percent	%	83.8	
27-__	1	Metals in Solids by ICP			
		Arsenic	mg/kg	18.2	5.41
		Barium	mg/kg	186	2.17
		Cadmium	mg/kg	7.00	1.08
		Lead	mg/kg	921	5.41
		Zinc	mg/kg	1670	5.41
27-__	1	Percent Solid			
		Solids, percent	%	84.0	
28-__	1	Metals in Solids by ICP			
		Arsenic	mg/kg	12.2	6.27
		Barium	mg/kg	305	2.51
		Cadmium	mg/kg	4.79	1.25
		Lead	mg/kg	559	6.27
		Zinc	mg/kg	866	6.27
28-__	1	Percent Solid			
		Solids, percent	%	76.7	
29-__	1	Metals in Solids by ICP			
		Arsenic	mg/kg	98.2	6.59
		Barium	mg/kg	192	2.64
		Cadmium	mg/kg	11.6	1.32
		Lead	mg/kg	2270	6.59
		Zinc	mg/kg	3210	6.59
29-__	1	Percent Solid			
		Solids, percent	%	75.1	
30-__	1	Metals in Solids by ICP			
		Arsenic	mg/kg	13.6	5.75
		Barium	mg/kg	231	2.30
		Cadmium	mg/kg	7.65	1.15
		Lead	mg/kg	1050	5.75
		Zinc	mg/kg	1480	5.75

Page 6 of 8

ASR Number: 3156 **HRS Analysis Results Supplement** 03/27/2007

Sample	Analysis / Analyte		Units	Result	RL
30-__	1	Percent Solid			
		Solids, percent	%	80.4	
31-__	1	Metals in Solids by ICP			
		Arsenic	mg/kg	12.7	5.60
		Barium	mg/kg	189	2.24
		Cadmium	mg/kg	5.16	1.12
		Lead	mg/kg	396	5.60
		Zinc	mg/kg	1030	5.60
31-__	1	Percent Solid			
		Solids, percent	%	80.5	
32-__	1	Metals in Solids by ICP			
		Arsenic	mg/kg	90.0	5.95
		Barium	mg/kg	228	2.38
		Cadmium	mg/kg	9.18	1.19
		Lead	mg/kg	2100	5.95
		Zinc	mg/kg	2460	5.95
32-__	1	Percent Solid			
		Solids, percent	%	75.7	
33-__	1	Metals in Solids by ICP			
		Arsenic	mg/kg	15.9	5.74
		Barium	mg/kg	189	2.30
		Cadmium	mg/kg	9.12	1.15
		Lead	mg/kg	825	5.74
		Zinc	mg/kg	2310	5.74
33-__	1	Percent Solid			
		Solids, percent	%	82.9	
34-__	1	Metals in Solids by ICP			
		Arsenic	mg/kg	14.0	6.66
		Barium	mg/kg	219	2.66
		Cadmium	mg/kg	6.30	1.33
		Lead	mg/kg	599	6.66
		Zinc	mg/kg	978	6.66
34-__	1	Percent Solid			
		Solids, percent	%	73.6	
35-__	1	Metals in Solids by ICP			
		Arsenic	mg/kg	9.97	5.89
		Barium	mg/kg	171	2.36
		Cadmium	mg/kg	11.3	1.18
		Lead	mg/kg	503	5.89
		Zinc	mg/kg	1630	5.89
35-__	1	Percent Solid			
		Solids, percent	%	79.3	

Page 7 of 8

ASR Number: 3156 **HRS Analysis Results Supplement** 03/27/2007

Sample	Analysis / Analyte		Units	Result	RL
36-__	1	Metals in Solids by ICP			
		Arsenic	mg/kg	10.2	5.98
		Barium	mg/kg	155	2.39
		Cadmium	mg/kg	7.32	1.20
		Lead	mg/kg	374	5.98
		Zinc	mg/kg	1320	5.98
36-__	1	Percent Solid			
		Solids, percent	%	82.0	
37-__	1	Metals in Solids by ICP			
		Arsenic	mg/kg	10.6	5.93
		Barium	mg/kg	145	2.37
		Cadmium	mg/kg	6.11	1.19
		Lead	mg/kg	529	5.93
		Zinc	mg/kg	1250	5.93
37-__	1	Percent Solid			
		Solids, percent	%	79.6	

Memo From: Barry Evans, EPA Lab
Telephone: (913) 551-5144

Reference 15

HRS Analysis Results Supplement

03/27/2007

ASR Number: 3157

This report supplements the information contained in the Transmittal of Sample Analysis Results for ASR 3157 sent to Eddie McGlasson on 12/06/2006 for: EMA78Q00 - United Zinc No. 1 site sampling. The transmittal contains the explanation of codes, units, and qualifiers; sample information; analysis information and comments; and the analytical results. The RL in this supplement is the laboratory's reporting limit for that analyte with any dilution factor, volume adjustment, or percent solids for that sample analysis taken into account and is sometimes called the sample quantitation limit, SQL.

Sample	Analysis / Analyte		Units	Result	RL
1-__	1	Metals in Solids by ICP			
		Arsenic	mg/kg	58.3	6.49
		Barium	mg/kg	101	2.59
		Cadmium	mg/kg	11.0	1.30
		Lead	mg/kg	2040 J	6.49
		Zinc	mg/kg	1340	6.49
1-__	1	Percent Solid			
		Solids, percent	%	77.1	
2-__	1	Metals in Solids by ICP			
		Arsenic	mg/kg	9.50	6.19
		Barium	mg/kg	188	2.48
		Cadmium	mg/kg	11.3	1.24
		Lead	mg/kg	662	6.19
		Zinc	mg/kg	1110	6.19
2-__	1	Percent Solid			
		Solids, percent	%	80.7	
3-__	1	Metals in Solids by ICP			
		Arsenic	mg/kg	12.9	6.47
		Barium	mg/kg	246	2.59
		Cadmium	mg/kg	9.37	1.29
		Lead	mg/kg	824	6.47
		Zinc	mg/kg	1390	6.47
3-__	1	Percent Solid			
		Solids, percent	%	76.5	
4-__	1	Metals in Solids by ICP			
		Arsenic	mg/kg	8.15	6.71
		Barium	mg/kg	189	2.68
		Cadmium	mg/kg	11.8	1.34
		Lead	mg/kg	726	6.71
		Zinc	mg/kg	1440	6.71
4-__	1	Percent Solid			
		Solids, percent	%	73.1	

ASR Number: 3157 **HRS Analysis Results Supplement** 03/27/2007

Sample	Analysis / Analyte		Units	Result	RL
5-__	1	Metals in Solids by ICP			
		Arsenic	mg/kg	6.89 U	6.82
		Barium	mg/kg	127	2.73
		Cadmium	mg/kg	9.47	1.36
		Lead	mg/kg	542	6.82
		Zinc	mg/kg	984	6.82
5-__	1	Percent Solid			
		Solids, percent	%	72.6	
6-__	1	Metals in Solids by ICP			
		Arsenic	mg/kg	118	5.47
		Barium	mg/kg	159	2.19
		Cadmium	mg/kg	45.4	1.09
		Lead	mg/kg	8390	5.47
		Zinc	mg/kg	4560	5.47
6-__	1	Percent Solid			
		Solids, percent	%	90.6	
7-__	1	Metals in Solids by ICP			
		Arsenic	mg/kg	18.8	6.33
		Barium	mg/kg	186	2.53
		Cadmium	mg/kg	10.1	1.27
		Lead	mg/kg	871	6.33
		Zinc	mg/kg	1380	6.33
7-__	1	Percent Solid			
		Solids, percent	%	79.0	
8-__	1	Metals in Solids by ICP			
		Arsenic	mg/kg	14.5	6.47
		Barium	mg/kg	153	2.59
		Cadmium	mg/kg	10.8	1.29
		Lead	mg/kg	748	6.47
		Zinc	mg/kg	1270	6.47
8-__	1	Percent Solid			
		Solids, percent	%	72.9	
9-__	1	Metals in Solids by ICP			
		Arsenic	mg/kg	5.71	6.19
		Barium	mg/kg	92.8	2.48
		Cadmium	mg/kg	7.30	1.24
		Lead	mg/kg	505	6.19
		Zinc	mg/kg	659	6.19
9-__	1	Percent Solid			
		Solids, percent	%	80.0	
10-__	1	Metals in Solids by ICP			
		Arsenic	mg/kg	13.4	6.30

ASR Number: 3157 **HRS Analysis Results Supplement** 03/27/2007

Sample	Analysis / Analyte		Units	Result	RL
10-__	1	Metals in Solids by ICP			
		Barium	mg/kg	142	2.52
		Cadmium	mg/kg	10.7	1.26
		Lead	mg/kg	674	6.30
		Zinc	mg/kg	1460	6.30
10-__	1	Percent Solid			
		Solids, percent	%	77.1	
11-__	1	Metals in Solids by ICP			
		Arsenic	mg/kg	8.52	6.30
		Barium	mg/kg	228	2.52
		Cadmium	mg/kg	7.31	1.26
		Lead	mg/kg	275	6.30
		Zinc	mg/kg	678	6.30
11-__	1	Percent Solid			
		Solids, percent	%	79.4	
12-__	1	Metals in Solids by ICP			
		Arsenic	mg/kg	9.59	6.00
		Barium	mg/kg	141	2.40
		Cadmium	mg/kg	9.26	1.20
		Lead	mg/kg	950	6.00
		Zinc	mg/kg	994	6.00
12-__	1	Percent Solid			
		Solids, percent	%	80.2	
13-__	1	Metals in Solids by ICP			
		Arsenic	mg/kg	18.7	5.93
		Barium	mg/kg	196	2.37
		Cadmium	mg/kg	10.8	1.19
		Lead	mg/kg	1120	5.93
		Zinc	mg/kg	1680	5.93
13-__	1	Percent Solid			
		Solids, percent	%	82.7	
14-__	1	Metals in Solids by ICP			
		Arsenic	mg/kg	24.2	6.29
		Barium	mg/kg	140	2.52
		Cadmium	mg/kg	10.1	1.26
		Lead	mg/kg	1520	6.29
		Zinc	mg/kg	1530	6.29
14-__	1	Percent Solid			
		Solids, percent	%	77.9	
15-__	1	Metals in Solids by ICP			
		Arsenic	mg/kg	27.6	6.17
		Barium	mg/kg	220	2.47

Page 3 of 4

Memo From: Barry Evans, EPA Lab
Telephone: (913) 551-5144

Reference 15

ASR Number: 3157 **HRS Analysis Results Supplement** 03/27/2007

Sample	Analysis / Analyte		Units	Result	RL
15-__	1	Metals in Solids by ICP			
		Cadmium	mg/kg	10.2	1.23
		Lead	mg/kg	3980	6.17
		Zinc	mg/kg	1330	6.17
15-__	1	Percent Solid			
		Solids, percent	%	81.1	
16-__	1	Metals in Solids by ICP			
		Arsenic	mg/kg	11.1	5.99
		Barium	mg/kg	133	2.39
		Cadmium	mg/kg	10.2	1.20
		Lead	mg/kg	665	5.99
		Zinc	mg/kg	1230	5.99
16-__	1	Percent Solid			
		Solids, percent	%	82.7	
17-__	1	Metals in Solids by ICP			
		Arsenic	mg/kg	8.04	6.05
		Barium	mg/kg	205	2.42
		Cadmium	mg/kg	11.7	1.21
		Lead	mg/kg	687	6.05
		Zinc	mg/kg	1650	6.05
17-__	1	Percent Solid			
		Solids, percent	%	81.0	
18-__	1	Metals in Solids by ICP			
		Arsenic	mg/kg	20.2	6.14
		Barium	mg/kg	304	2.46
		Cadmium	mg/kg	12.1	1.23
		Lead	mg/kg	1320	6.14
		Zinc	mg/kg	1710	6.14
18-__	1	Percent Solid			
		Solids, percent	%	80.7	

Page 4 of 4

Memo From: Barry Evans, EPA Lab
Telephone: (913) 551-5144

Reference 16

HRS Analysis Results Supplement

03/27/2007

ASR Number: 3158

This report supplements the information contained in the Transmittal of Sample Analysis Results for ASR 3158 sent to Eddie McGlasson on 12/19/2006 for: EMA78Q00 - United Zinc No. 1 site sampling. The transmittal contains the explanation of codes, units, and qualifiers; sample information; analysis information and comments; and the analytical results. The RL in this supplement is the laboratory's reporting limit for that analyte with any dilution factor, volume adjustment, or percent solids for that sample analysis taken into account and is sometimes called the sample quantitation limit, SQL.

Sample	Analysis / Analyte		Units	Result	RL
1-__	1	Metals in Solids by ICP			
		Arsenic	mg/kg	34.4	6.24
		Barium	mg/kg	237	2.50
		Cadmium	mg/kg	10.3 J	1.25
		Lead	mg/kg	2640	6.24
		Zinc	mg/kg	1520	6.24
1-__	1	Percent Solid			
		Solids, percent	%	77.8	
2-__	1	Metals in Solids by ICP			
		Arsenic	mg/kg	14.5	5.98
		Barium	mg/kg	230	2.39
		Cadmium	mg/kg	8.79 J	1.20
		Lead	mg/kg	1260	5.98
		Zinc	mg/kg	1440	5.98
2-__	1	Percent Solid			
		Solids, percent	%	80.4	
3-__	1	Metals in Solids by ICP			
		Arsenic	mg/kg	9.49	6.03
		Barium	mg/kg	175	2.41
		Cadmium	mg/kg	7.05 J	1.21
		Lead	mg/kg	426	6.03
		Zinc	mg/kg	1110	6.03
3-__	1	Percent Solid			
		Solids, percent	%	82.1	
4-__	1	Metals in Solids by ICP			
		Arsenic	mg/kg	13.4	5.65
		Barium	mg/kg	164	2.26
		Cadmium	mg/kg	7.35 J	1.13
		Lead	mg/kg	483	5.65
		Zinc	mg/kg	1090	5.65
4-__	1	Percent Solid			
		Solids, percent	%	85.9	

Memo From: Barry Evans, EPA Lab
Telephone: (913) 551-5144

Reference 16

ASR Number: 3158 **HRS Analysis Results Supplement** 03/27/2007

Sample	Analysis / Analyte		Units	Result	RL
5-__	1	Metals in Solids by ICP			
		Arsenic	mg/kg	19.5	5.80
		Barium	mg/kg	250	2.32
		Cadmium	mg/kg	13.1 J	1.16
		Lead	mg/kg	1150	5.80
		Zinc	mg/kg	2220	5.80
5-__	1	Percent Solid			
		Solids, percent	%	85.3	
6-__	1	Metals in Solids by ICP			
		Arsenic	mg/kg	15.2	6.43
		Barium	mg/kg	171	2.57
		Cadmium	mg/kg	9.33 J	1.29
		Lead	mg/kg	526	6.43
		Zinc	mg/kg	1490	6.43
6-__	1	Percent Solid			
		Solids, percent	%	75.5	
7-__	1	Metals in Solids by ICP			
		Arsenic	mg/kg	8.10	6.46
		Barium	mg/kg	165	2.58
		Cadmium	mg/kg	5.00 J	1.29
		Lead	mg/kg	327	6.46
		Zinc	mg/kg	523	6.46
7-__	1	Percent Solid			
		Solids, percent	%	76.7	
8-__	1	Metals in Solids by ICP			
		Arsenic	mg/kg	18.3	6.26
		Barium	mg/kg	219	2.50
		Cadmium	mg/kg	12.7 J	1.25
		Lead	mg/kg	940	6.26
		Zinc	mg/kg	1830	6.26
8-__	1	Percent Solid			
		Solids, percent	%	78.3	
9-__	1	Metals in Solids by ICP			
		Arsenic	mg/kg	23.4	6.28
		Barium	mg/kg	286	2.51
		Cadmium	mg/kg	11.8 J	1.26
		Lead	mg/kg	1620	6.28
		Zinc	mg/kg	2270	6.28
9-__	1	Percent Solid			
		Solids, percent	%	75.1	
10-__	1	Metals in Solids by ICP			
		Arsenic	mg/kg	145	6.72

Memo From: Barry Evans, EPA Lab
Telephone: (913) 551-5144

Reference 16

ASR Number: 3158 **HRS Analysis Results Supplement** 03/27/2007

Sample	Analysis / Analyte		Units	Result	RL
10-__	1	Metals in Solids by ICP			
		Barium	mg/kg	247	2.69
		Cadmium	mg/kg	28.2 J	1.34
		Lead	mg/kg	5550	6.72
		Zinc	mg/kg	4640	6.72
10-__	1	Percent Solid			
		Solids, percent	%	74.5	
11-__	1	Metals in Solids by ICP			
		Arsenic	mg/kg	27.4	6.54
		Barium	mg/kg	159	2.62
		Cadmium	mg/kg	9.98 J	1.31
		Lead	mg/kg	961	6.54
		Zinc	mg/kg	1730	6.54
11-__	1	Percent Solid			
		Solids, percent	%	74.9	

Page 3 of 3

Memo From: Barry Evans, EPA Lab
Telephone: (913) 551-5144

Reference 17

HRS Analysis Results Supplement

03/27/2007

ASR Number: 3151

This report supplements the information contained in the Transmittal of Sample Analysis Results for ASR 3151 sent to Eddie McGlasson on 08/29/2006 for: EMA78Q00 - United Zinc No. 1 site sampling. The transmittal contains the explanation of codes, units, and qualifiers; sample information; analysis information and comments; and the analytical results. The RL in this supplement is the laboratory's reporting limit for that analyte with any dilution factor, volume adjustment, or percent solids for that sample analysis taken into account and is sometimes called the sample quantitation limit, SQL.

Sample	Analysis / Analyte		Units	Result	RL
1-__	1	Metals in Solids by ICP			
		Arsenic	mg/kg	10.1	6.23
		Barium	mg/kg	182	2.49
		Cadmium	mg/kg	10.6	1.25
		Lead	mg/kg	552	6.23
		Zinc	mg/kg	1160	6.23
1-__	1	Percent Solid			
		Solids, percent	%	78.7	
2-__	1	Metals in Solids by ICP			
		Arsenic	mg/kg	12.3	5.26
		Barium	mg/kg	130	2.10
		Cadmium	mg/kg	10.6	1.05
		Lead	mg/kg	907	5.26
		Zinc	mg/kg	1140	5.26
2-__	1	Percent Solid			
		Solids, percent	%	94.1	
3-__	1	Metals in Solids by ICP			
		Arsenic	mg/kg	11.7	5.76
		Barium	mg/kg	144	2.30
		Cadmium	mg/kg	9.85	1.15
		Lead	mg/kg	631	5.76
		Zinc	mg/kg	1250	5.76
3-__	1	Percent Solid			
		Solids, percent	%	85.9	
4-__	1	Metals in Solids by ICP			
		Arsenic	mg/kg	5.91	5.27
		Barium	mg/kg	121	2.11
		Cadmium	mg/kg	11.0	1.05
		Lead	mg/kg	817	5.27
		Zinc	mg/kg	1130	5.27
4-__	1	Percent Solid			
		Solids, percent	%	94.0	

Memo From: Barry Evans, EPA Lab
Telephone: (913) 551-5144

Reference 17

ASR Number: 3151 **HRS Analysis Results Supplement** 03/27/2007

Sample	Analysis / Analyte		Units	Result	RL
5-__	1	Metals in Solids by ICP			
		Arsenic	mg/kg	16.8	5.43
		Barium	mg/kg	251	2.17
		Cadmium	mg/kg	10.3	1.09
		Lead	mg/kg	1440	5.43
		Zinc	mg/kg	1140	5.43
5-__	1	Percent Solid			
		Solids, percent	%	90.2	
6-__	1	Metals in Solids by ICP			
		Arsenic	mg/kg	14.4	5.54
		Barium	mg/kg	143	2.22
		Cadmium	mg/kg	9.16	1.11
		Lead	mg/kg	805	5.54
		Zinc	mg/kg	980	5.54
6-__	1	Percent Solid			
		Solids, percent	%	89.3	
7-__	1	Metals in Solids by ICP			
		Arsenic	mg/kg	14.3	5.24
		Barium	mg/kg	177	2.09
		Cadmium	mg/kg	11.0	1.05
		Lead	mg/kg	1660	5.24
		Zinc	mg/kg	2400	5.24
7-__	1	Percent Solid			
		Solids, percent	%	95.5	
8-__	1	Metals in Solids by ICP			
		Arsenic	mg/kg	10.5	5.29
		Barium	mg/kg	132	2.11
		Cadmium	mg/kg	9.19	1.06
		Lead	mg/kg	290	5.29
		Zinc	mg/kg	737	5.29
8-__	1	Percent Solid			
		Solids, percent	%	91.8	
9-__	1	Metals in Solids by ICP			
		Arsenic	mg/kg	9.05	5.16
		Barium	mg/kg	114	2.06
		Cadmium	mg/kg	8.93	1.03
		Lead	mg/kg	647	5.16
		Zinc	mg/kg	1280	5.16
9-__	1	Percent Solid			
		Solids, percent	%	95.0	
10-__	1	Metals in Solids by ICP			
		Arsenic	mg/kg	6.38	5.42

Memo From: Barry Evans, EPA Lab
Telephone: (913) 551-5144

Reference 17

ASR Number: 3151 **HRS Analysis Results Supplement** 03/27/2007

Sample	Analysis / Analyte		Units	Result	RL
10-__	1	Metals in Solids by ICP			
		Barium	mg/kg	308	2.17
		Cadmium	mg/kg	8.04	1.08
		Lead	mg/kg	396	5.42
		Zinc	mg/kg	772	5.42
10-__	1	Percent Solid			
		Solids, percent	%	91.3	
11-__	1	Metals in Solids by ICP			
		Arsenic	mg/kg	5 U	5.94
		Barium	mg/kg	190	2.38
		Cadmium	mg/kg	6.86	1.19
		Lead	mg/kg	111	5.94
		Zinc	mg/kg	307	5.94
11-__	1	Percent Solid			
		Solids, percent	%	82.5	
12-__	1	Metals in Solids by ICP			
		Arsenic	mg/kg	6.79	5.74
		Barium	mg/kg	149	2.29
		Cadmium	mg/kg	10.2	1.15
		Lead	mg/kg	58.8	5.74
		Zinc	mg/kg	139	5.74
12-__	1	Percent Solid			
		Solids, percent	%	85.5	

Page 3 of 3

Memo From: Barry Evans, EPA Lab
Telephone: (913) 551-5144

Reference 18

HRS Analysis Results Supplement

03/27/2007

ASR Number: 3152

This report supplements the information contained in the Transmittal of Sample Analysis Results for ASR 3152 sent to Eddie McGlasson on 09/20/2006 for: EMA78Q00 - United Zinc No. 1 site sampling. The transmittal contains the explanation of codes, units, and qualifiers; sample information; analysis information and comments; and the analytical results. The RL in this supplement is the laboratory's reporting limit for that analyte with any dilution factor, volume adjustment, or percent solids for that sample analysis taken into account and is sometimes called the sample quantitation limit, SQL.

Sample	Analysis / Analyte		Units	Result	RL
1-__	1	Metals in Solids by ICP			
		Arsenic	mg/kg	13.2	1.14
		Barium	mg/kg	141	22.9
		Cadmium	mg/kg	4.68 J	0.571
		Lead	mg/kg	946	1.14
		Zinc	mg/kg	1610	6.86
2-__	1	Metals in Solids by ICP			
		Arsenic	mg/kg	15.2	1.26
		Barium	mg/kg	194	25.2
		Cadmium	mg/kg	5.72 J	0.630
		Lead	mg/kg	991	1.26
		Zinc	mg/kg	1420	7.56
3-__	1	Metals in Solids by ICP			
		Arsenic	mg/kg	16.6	1.25
		Barium	mg/kg	219	25.0
		Cadmium	mg/kg	5.85 J	0.624
		Lead	mg/kg	782	1.25
		Zinc	mg/kg	1580	7.49
4-__	1	Metals in Solids by ICP			
		Arsenic	mg/kg	26.1	1.31
		Barium	mg/kg	212	26.2
		Cadmium	mg/kg	9.67 J	0.654
		Lead	mg/kg	1200	1.31
		Zinc	mg/kg	3180	7.85
5-__	1	Metals in Solids by ICP			
		Arsenic	mg/kg	90.6	1.19
		Barium	mg/kg	213	23.8
		Cadmium	mg/kg	4.18 J	0.595
		Lead	mg/kg	1640	1.19
		Zinc	mg/kg	1770	7.13
6-__	1	Metals in Solids by ICP			
		Arsenic	mg/kg	33.8	1.07
		Barium	mg/kg	221	21.4
		Cadmium	mg/kg	6.38 J	0.535

Memo From: Barry Evans, EPA Lab
Telephone: (913) 551-5144

Reference 18

ASR Number: 3152 **HRS Analysis Results Supplement** 03/27/2007

Sample	Analysis / Analyte		Units	Result	RL
6-__	1	Metals in Solids by ICP			
		Lead	mg/kg	838	1.07
		Zinc	mg/kg	1720	6.42
7-__	1	Metals in Solids by ICP			
		Arsenic	mg/kg	16.4	1.14
		Barium	mg/kg	262	22.9
		Cadmium	mg/kg	8.39 J	0.572
		Lead	mg/kg	1140	1.14
		Zinc	mg/kg	2420	6.86
8-__	1	Metals in Solids by ICP			
		Arsenic	mg/kg	15.4	1.12
		Barium	mg/kg	199	22.4
		Cadmium	mg/kg	5.62 J	0.561
		Lead	mg/kg	1130	1.12
		Zinc	mg/kg	1920	6.73
9-__	1	Metals in Solids by ICP			
		Arsenic	mg/kg	7.40 U	1.09
		Barium	mg/kg	186	21.8
		Cadmium	mg/kg	4.05 J	0.546
		Lead	mg/kg	400	1.09
		Zinc	mg/kg	952	6.55
10-__	1	Metals in Solids by ICP			
		Arsenic	mg/kg	8.54 U	1.14
		Barium	mg/kg	147	22.7
		Cadmium	mg/kg	5.39 J	0.568
		Lead	mg/kg	518	1.14
		Zinc	mg/kg	1600	6.81
11-__	1	Metals in Solids by ICP			
		Arsenic	mg/kg	8.54 U	1.20
		Barium	mg/kg	166	24.1
		Cadmium	mg/kg	4.12 J	0.602
		Lead	mg/kg	541	1.20
		Zinc	mg/kg	1310	7.23
12-__	1	Metals in Solids by ICP			
		Arsenic	mg/kg	8.22 U	1.32
		Barium	mg/kg	376	26.4
		Cadmium	mg/kg	5.75 J	0.660
		Lead	mg/kg	1050	1.32
		Zinc	mg/kg	1860	7.92
13-__	1	Metals in Solids by ICP			
		Arsenic	mg/kg	18.0	1.20
		Barium	mg/kg	203	24.1
		Cadmium	mg/kg	6.71 J	0.602

Memo From: Barry Evans, EPA Lab
Telephone: (913) 551-5144

Reference 18

ASR Number: 3152 **HRS Analysis Results Supplement** 03/27/2007

Sample	Analysis / Analyte		Units	Result	RL
13-__	1	Metals in Solids by ICP			
		Lead	mg/kg	1050	1.20
		Zinc	mg/kg	2020	7.23
14-__	1	Metals in Solids by ICP			
		Arsenic	mg/kg	16.6	1.27
		Barium	mg/kg	230	25.5
		Cadmium	mg/kg	6.32 J	0.637
		Lead	mg/kg	1010	1.27
		Zinc	mg/kg	2660	7.64
15-__	1	Metals in Solids by ICP			
		Arsenic	mg/kg	8.74 U	1.25
		Barium	mg/kg	198	25.0
		Cadmium	mg/kg	4.86 J	0.625
		Lead	mg/kg	582	1.25
		Zinc	mg/kg	1750	7.50
16-__	1	Metals in Solids by ICP			
		Arsenic	mg/kg	8.51 U	1.20
		Barium	mg/kg	177	24.1
		Cadmium	mg/kg	2.35 J	0.602
		Lead	mg/kg	996	1.20
		Zinc	mg/kg	645	7.22
17-__	1	Metals in Solids by ICP			
		Arsenic	mg/kg	29.9	1.18
		Barium	mg/kg	252	23.6
		Cadmium	mg/kg	24.4 J	0.591
		Lead	mg/kg	2010	1.18
		Zinc	mg/kg	6230	21.3
18-__	1	Metals in Solids by ICP			
		Arsenic	mg/kg	7.81 U	1.12
		Barium	mg/kg	148	22.3
		Cadmium	mg/kg	2.40 J	0.558
		Lead	mg/kg	270	1.12
		Zinc	mg/kg	686	6.70
19-__	1	Metals in Solids by ICP			
		Arsenic	mg/kg	21.6	1.14
		Barium	mg/kg	208	22.7
		Cadmium	mg/kg	7.73 J	0.568
		Lead	mg/kg	1270	1.14
		Zinc	mg/kg	3680	13.6
20-__	1	Metals in Solids by ICP			
		Arsenic	mg/kg	8.09 U	1.16
		Barium	mg/kg	184	23.1
		Cadmium	mg/kg	3.42 J	0.579

Memo From: Barry Evans, EPA Lab
Telephone: (913) 551-5144

Reference 18

ASR Number: 3152 **HRS Analysis Results Supplement** 03/27/2007

Sample	Analysis / Analyte		Units	Result	RL
20-__	1	Metals in Solids by ICP			
		Lead	mg/kg	600	1.16
		Zinc	mg/kg	917	6.94

Page 4 of 4

Memo From: Barry Evans, EPA Lab
Telephone: (913) 551-5144

Reference 19

HRS Analysis Results Supplement

03/27/2007

ASR Number: 3153

This report supplements the information contained in the Transmittal of Sample Analysis Results for ASR 3153 sent to Eddie McGlasson on 10/12/2006 for: EMA78Q00 - United Zinc No. 1 site sampling. The transmittal contains the explanation of codes, units, and qualifiers; sample information; analysis information and comments; and the analytical results. The RL in this supplement is the laboratory's reporting limit for that analyte with any dilution factor, volume adjustment, or percent solids for that sample analysis taken into account and is sometimes called the sample quantitation limit, SQL.

Sample	Analysis / Analyte		Units	Result	RL
1-__	1	Metals in Solids by ICP			
		Arsenic	mg/kg	5 U	5.60
		Barium	mg/kg	122	2.24
		Cadmium	mg/kg	7.81	1.12
		Lead	mg/kg	412	5.60
		Zinc	mg/kg	1190	5.60
1-__	1	Percent Solid			
		Solids, percent	%	88.3	
2-__	1	Metals in Solids by ICP			
		Arsenic	mg/kg	5 U	5.30
		Barium	mg/kg	204	2.12
		Cadmium	mg/kg	8.75	1.06
		Lead	mg/kg	275	5.30
		Zinc	mg/kg	437	5.30
2-__	1	Percent Solid			
		Solids, percent	%	91.5	
3-__	1	Metals in Solids by ICP			
		Arsenic	mg/kg	5 U	5.32
		Barium	mg/kg	161	2.13
		Cadmium	mg/kg	6.57	1.06
		Lead	mg/kg	204	5.32
		Zinc	mg/kg	476	5.32
3-__	1	Percent Solid			
		Solids, percent	%	92.1	
4-__	1	Metals in Solids by ICP			
		Arsenic	mg/kg	5 U	5.41
		Barium	mg/kg	103	2.16
		Cadmium	mg/kg	9.96	1.08
		Lead	mg/kg	460	5.41
		Zinc	mg/kg	1050	5.41
4-__	1	Percent Solid			
		Solids, percent	%	91.5	

Memo From: Barry Evans, EPA Lab
Telephone: (913) 551-5144

Reference 19

ASR Number: 3153 **HRS Analysis Results Supplement** 03/27/2007

Sample	Analysis / Analyte		Units	Result	RL
5-__	1	Metals in Solids by ICP			
		Arsenic	mg/kg	5 U	5.21
		Barium	mg/kg	145	2.08
		Cadmium	mg/kg	10.2	1.04
		Lead	mg/kg	566	5.21
		Zinc	mg/kg	1080	5.21
5-__	1	Percent Solid			
		Solids, percent	%	92.3	
6-__	1	Metals in Solids by ICP			
		Arsenic	mg/kg	5 U	5.59
		Barium	mg/kg	162	2.24
		Cadmium	mg/kg	6.75	1.12
		Lead	mg/kg	166	5.59
		Zinc	mg/kg	351	5.59
6-__	1	Percent Solid			
		Solids, percent	%	87.7	
7-__	1	Metals in Solids by ICP			
		Arsenic	mg/kg	5 U	5.40
		Barium	mg/kg	156	2.16
		Cadmium	mg/kg	9.85	1.08
		Lead	mg/kg	504	5.40
		Zinc	mg/kg	1460	5.40
7-__	1	Percent Solid			
		Solids, percent	%	92.7	
8-__	1	Metals in Solids by ICP			
		Arsenic	mg/kg	5 U	5.40
		Barium	mg/kg	249	2.16
		Cadmium	mg/kg	9.98	1.08
		Lead	mg/kg	420	5.40
		Zinc	mg/kg	1080	5.40
8-__	1	Percent Solid			
		Solids, percent	%	90.8	
9-__	1	Metals in Solids by ICP			
		Arsenic	mg/kg	5 U	5.33
		Barium	mg/kg	137	2.13
		Cadmium	mg/kg	6.34	1.07
		Lead	mg/kg	296	5.33
		Zinc	mg/kg	544	5.33
9-__	1	Percent Solid			
		Solids, percent	%	91.7	
10-__	1	Metals in Solids by ICP			
		Arsenic	mg/kg	5 U	5.39

ASR Number: 3153 **HRS Analysis Results Supplement** 03/27/2007

Sample	Analysis / Analyte		Units	Result	RL
10-__	1	Metals in Solids by ICP			
		Barium	mg/kg	141	2.16
		Cadmium	mg/kg	9.07	1.08
		Lead	mg/kg	484	5.39
		Zinc	mg/kg	1150	5.39
10-__	1	Percent Solid			
		Solids, percent	%	91.1	
11-__	1	Metals in Solids by ICP			
		Arsenic	mg/kg	7.34	5.35
		Barium	mg/kg	155	2.14
		Cadmium	mg/kg	10.5	1.07
		Lead	mg/kg	738	5.35
		Zinc	mg/kg	1350	5.35
11-__	1	Percent Solid			
		Solids, percent	%	89.2	
12-__	1	Metals in Solids by ICP			
		Arsenic	mg/kg	5 U	5.69
		Barium	mg/kg	134	2.28
		Cadmium	mg/kg	7.05	1.14
		Lead	mg/kg	406	5.69
		Zinc	mg/kg	883	5.69
12-__	1	Percent Solid			
		Solids, percent	%	92.6	
13-__	1	Metals in Solids by ICP			
		Arsenic	mg/kg	64.0	5.45
		Barium	mg/kg	173	2.18
		Cadmium	mg/kg	17.6	1.09
		Lead	mg/kg	1690	5.45
		Zinc	mg/kg	2820	5.45
13-__	1	Percent Solid			
		Solids, percent	%	86.1	
14-__	1	Metals in Solids by ICP			
		Arsenic	mg/kg	24.5	5.06
		Barium	mg/kg	171	2.03
		Cadmium	mg/kg	9.02	1.01
		Lead	mg/kg	523	5.06
		Zinc	mg/kg	1090	5.06
14-__	1	Percent Solid			
		Solids, percent	%	87.3	
15-__	1	Metals in Solids by ICP			
		Arsenic	mg/kg	8.75	5.06
		Barium	mg/kg	249	2.03

Memo From: Barry Evans, EPA Lab
Telephone: (913) 551-5144

Reference 19

ASR Number: 3153 **HRS Analysis Results Supplement** 03/27/2007

Sample	Analysis / Analyte		Units	Result	RL
15-__	1	Metals in Solids by ICP			
		Cadmium	mg/kg	11.3	1.01
		Lead	mg/kg	699	5.06
		Zinc	mg/kg	1600	5.06
15-__	1	Percent Solid			
		Solids, percent	%	95.9	
16-__	1	Metals in Solids by ICP			
		Arsenic	mg/kg	5 U	5.32
		Barium	mg/kg	160	2.13
		Cadmium	mg/kg	10.0	1.06
		Lead	mg/kg	1050	5.32
		Zinc	mg/kg	1950	5.32
16-__	1	Percent Solid			
		Solids, percent	%	94.9	
17-__	1	Metals in Solids by ICP			
		Arsenic	mg/kg	5 U	5.32
		Barium	mg/kg	159	2.13
		Cadmium	mg/kg	8.83	1.06
		Lead	mg/kg	515	5.32
		Zinc	mg/kg	1170	5.32
17-__	1	Percent Solid			
		Solids, percent	%	93.1	

Page 4 of 4

Memo From: Barry Evans, EPA Lab
Telephone: (913) 551-5144

Reference 20

HRS Analysis Results Supplement

03/27/2007

ASR Number: 3154

This report supplements the information contained in the Transmittal of Sample Analysis Results for ASR 3154 sent to Eddie McGlasson on 10/18/2006 for: EMA78Q00 - United Zinc No. 1 site sampling. The transmittal contains the explanation of codes, units, and qualifiers; sample information; analysis information and comments; and the analytical results. The RL in this supplement is the laboratory's reporting limit for that analyte with any dilution factor, volume adjustment, or percent solids for that sample analysis taken into account and is sometimes called the sample quantitation limit, SQL.

Sample	Analysis / Analyte		Units	Result	RL
1-__	1	Metals in Solids by ICP			
		Arsenic	mg/kg	9.93	1.25
		Barium	mg/kg	196	25.1
		Cadmium	mg/kg	3.78	0.627
		Lead	mg/kg	329	1.25
		Zinc	mg/kg	844	7.52
2-__	1	Metals in Solids by ICP			
		Arsenic	mg/kg	8.14	1.14
		Barium	mg/kg	107	22.8
		Cadmium	mg/kg	4.61	0.570
		Lead	mg/kg	593	1.14
		Zinc	mg/kg	1270	6.84
3-__	1	Metals in Solids by ICP			
		Arsenic	mg/kg	10.1	1.26
		Barium	mg/kg	156	25.1
		Cadmium	mg/kg	4.87	0.628
		Lead	mg/kg	635	1.26
		Zinc	mg/kg	1320	7.54
4-__	1	Metals in Solids by ICP			
		Arsenic	mg/kg	9.51	1.22
		Barium	mg/kg	164	24.4
		Cadmium	mg/kg	4.56	0.609
		Lead	mg/kg	509	1.22
		Zinc	mg/kg	1080	7.31
5-__	1	Metals in Solids by ICP			
		Arsenic	mg/kg	5.12	1.17
		Barium	mg/kg	167	23.3
		Cadmium	mg/kg	2.43	0.583
		Lead	mg/kg	255	1.17
		Zinc	mg/kg	610	6.99
6-__	1	Metals in Solids by ICP			
		Arsenic	mg/kg	10.9	1.19
		Barium	mg/kg	244	23.8
		Cadmium	mg/kg	4.29	0.596

ASR Number: 3154 **HRS Analysis Results Supplement** 03/27/2007

Sample	Analysis / Analyte		Units	Result	RL
6-__	1	Metals in Solids by ICP			
		Lead	mg/kg	761	1.19
		Zinc	mg/kg	1370	7.15
7-__	1	Metals in Solids by ICP			
		Arsenic	mg/kg	21.5	1.13
		Barium	mg/kg	264	22.5
		Cadmium	mg/kg	8.01	0.564
		Lead	mg/kg	1480	1.13
		Zinc	mg/kg	2730	6.76
8-__	1	Metals in Solids by ICP			
		Arsenic	mg/kg	9.20	1.19
		Barium	mg/kg	195	23.7
		Cadmium	mg/kg	4.94	0.593
		Lead	mg/kg	568	1.19
		Zinc	mg/kg	1440	7.12
9-__	1	Metals in Solids by ICP			
		Arsenic	mg/kg	13.6	1.09
		Barium	mg/kg	210	21.9
		Cadmium	mg/kg	7.77	0.547
		Lead	mg/kg	1280	1.09
		Zinc	mg/kg	2140	6.56
10-__	1	Metals in Solids by ICP			
		Arsenic	mg/kg	14.6	1.12
		Barium	mg/kg	283	22.5
		Cadmium	mg/kg	5.45	0.562
		Lead	mg/kg	1390	1.12
		Zinc	mg/kg	1400	6.74
11-__	1	Metals in Solids by ICP			
		Arsenic	mg/kg	13.7	1.20
		Barium	mg/kg	192	24.0
		Cadmium	mg/kg	12.1	0.600
		Lead	mg/kg	1380	1.20
		Zinc	mg/kg	13100	50.4
12-__	1	Metals in Solids by ICP			
		Arsenic	mg/kg	13.2	1.16
		Barium	mg/kg	229	23.1
		Cadmium	mg/kg	5.79	0.579
		Lead	mg/kg	857	1.16
		Zinc	mg/kg	1730	6.94
13-__	1	Metals in Solids by ICP			
		Arsenic	mg/kg	15.2	1.17
		Barium	mg/kg	679	23.4
		Cadmium	mg/kg	5.43	0.586

Memo From: Barry Evans, EPA Lab
Telephone: (913) 551-5144

Reference 20

ASR Number: 3154 **HRS Analysis Results Supplement** 03/27/2007

Sample	Analysis / Analyte		Units	Result	RL
13-__	1	Metals in Solids by ICP			
		Lead	mg/kg	1040	1.17
		Zinc	mg/kg	2020	7.03
14-__	1	Metals in Solids by ICP			
		Arsenic	mg/kg	15.2	1.21
		Barium	mg/kg	204	24.2
		Cadmium	mg/kg	7.58	0.605
		Lead	mg/kg	916	1.21
		Zinc	mg/kg	1910	7.26
15-__	1	Metals in Solids by ICP			
		Arsenic	mg/kg	15.0	1.17
		Barium	mg/kg	151	23.3
		Cadmium	mg/kg	4.24	0.583
		Lead	mg/kg	1140	1.17
		Zinc	mg/kg	1160	7.00
16-__	1	Metals in Solids by ICP			
		Arsenic	mg/kg	20.0	1.24
		Barium	mg/kg	182	24.8
		Cadmium	mg/kg	9.67	0.620
		Lead	mg/kg	748	1.24
		Zinc	mg/kg	2040	7.44
17-__	1	Metals in Solids by ICP			
		Arsenic	mg/kg	10.3	1.22
		Barium	mg/kg	145	24.4
		Cadmium	mg/kg	3.91	0.611
		Lead	mg/kg	719	1.22
		Zinc	mg/kg	1170	7.33
18-__	1	Metals in Solids by ICP			
		Arsenic	mg/kg	8.49	1.17
		Barium	mg/kg	149	23.5
		Cadmium	mg/kg	10.8	0.587
		Lead	mg/kg	449	1.17
		Zinc	mg/kg	1680	7.04
19-__	1	Metals in Solids by ICP			
		Arsenic	mg/kg	5.29	1.21
		Barium	mg/kg	197	24.1
		Cadmium	mg/kg	2.83	0.603
		Lead	mg/kg	380	1.21
		Zinc	mg/kg	614	7.24
20-__	1	Metals in Solids by ICP			
		Arsenic	mg/kg	6.23	1.20
		Barium	mg/kg	233	23.9
		Cadmium	mg/kg	3.07	0.598

Page 3 of 6

Memo From: Barry Evans, EPA Lab
Telephone: (913) 551-5144

Reference 20

ASR Number: 3154 **HRS Analysis Results Supplement** 03/27/2007

Sample	Analysis / Analyte		Units	Result	RL
20-__	1	Metals in Solids by ICP			
		Lead	mg/kg	264	1.20
		Zinc	mg/kg	595	7.18
21-__	1	Metals in Solids by ICP			
		Arsenic	mg/kg	5.84	1.15
		Barium	mg/kg	110	23.0
		Cadmium	mg/kg	1.82	0.574
		Lead	mg/kg	232	1.15
		Zinc	mg/kg	448	6.89
22-__	1	Metals in Solids by ICP			
		Arsenic	mg/kg	10.1	1.18
		Barium	mg/kg	159	23.5
		Cadmium	mg/kg	4.41	0.588
		Lead	mg/kg	581	1.18
		Zinc	mg/kg	1090	7.06
23-__	1	Metals in Solids by ICP			
		Arsenic	mg/kg	9.46	1.14
		Barium	mg/kg	231	22.9
		Cadmium	mg/kg	3.95	0.571
		Lead	mg/kg	461	1.14
		Zinc	mg/kg	769	6.86
24-__	1	Metals in Solids by ICP			
		Arsenic	mg/kg	9.06	1.15
		Barium	mg/kg	158	23.1
		Cadmium	mg/kg	2.28	0.577
		Lead	mg/kg	189	1.15
		Zinc	mg/kg	455	6.93
25-__	1	Metals in Solids by ICP			
		Arsenic	mg/kg	26.5	1.15
		Barium	mg/kg	108	23.0
		Cadmium	mg/kg	6.52	0.575
		Lead	mg/kg	1410	1.15
		Zinc	mg/kg	2470	6.90
26-__	1	Metals in Solids by ICP			
		Arsenic	mg/kg	11.3	1.15
		Barium	mg/kg	347	23.0
		Cadmium	mg/kg	6.67	0.575
		Lead	mg/kg	1500	1.15
		Zinc	mg/kg	2100	6.90
27-__	1	Metals in Solids by ICP			
		Arsenic	mg/kg	10.2	1.16
		Barium	mg/kg	266	23.2
		Cadmium	mg/kg	4.16	0.579

ASR Number: 3154 **HRS Analysis Results Supplement** 03/27/2007

Sample	Analysis / Analyte		Units	Result	RL
27-__	1	Metals in Solids by ICP			
		Lead	mg/kg	839	1.16
		Zinc	mg/kg	1020	6.95
28-__	1	Metals in Solids by ICP			
		Arsenic	mg/kg	21.9	1.14
		Barium	mg/kg	137	22.9
		Cadmium	mg/kg	6.49	0.572
		Lead	mg/kg	1190	1.14
		Zinc	mg/kg	1830	6.86
29-__	1	Metals in Solids by ICP			
		Arsenic	mg/kg	16.2	1.13
		Barium	mg/kg	159	22.6
		Cadmium	mg/kg	2.51	0.564
		Lead	mg/kg	916	1.13
		Zinc	mg/kg	800	6.77
30-__	1	Metals in Solids by ICP			
		Arsenic	mg/kg	13.2	1.15
		Barium	mg/kg	227	22.9
		Cadmium	mg/kg	5.62	0.573
		Lead	mg/kg	970	1.15
		Zinc	mg/kg	1570	6.88
31-__	1	Metals in Solids by ICP			
		Arsenic	mg/kg	19.6	1.15
		Barium	mg/kg	210	23.1
		Cadmium	mg/kg	5.88	0.577
		Lead	mg/kg	1690	1.15
		Zinc	mg/kg	1910	6.92
32-__	1	Metals in Solids by ICP			
		Arsenic	mg/kg	52.9	1.20
		Barium	mg/kg	204	24.0
		Cadmium	mg/kg	7.98	0.600
		Lead	mg/kg	2520	1.20
		Zinc	mg/kg	2300	7.19
33-__	1	Metals in Solids by ICP			
		Arsenic	mg/kg	21.4	1.15
		Barium	mg/kg	134	23.1
		Cadmium	mg/kg	6.41	0.577
		Lead	mg/kg	1230	1.15
		Zinc	mg/kg	2080	6.92
34-__	1	Metals in Solids by ICP			
		Arsenic	mg/kg	14.3	1.14
		Barium	mg/kg	224	22.7
		Cadmium	mg/kg	8.10	0.568

Memo From: Barry Evans, EPA Lab
Telephone: (913) 551-5144

Reference 20

ASR Number: 3154 **HRS Analysis Results Supplement** 03/27/2007

Sample	Analysis / Analyte		Units	Result	RL
34-__	1	Metals in Solids by ICP			
		Lead	mg/kg	1010	1.14
		Zinc	mg/kg	2350	6.81
35-__	1	Metals in Solids by ICP			
		Arsenic	mg/kg	116	1.16
		Barium	mg/kg	148	23.3
		Cadmium	mg/kg	10.4	0.581
		Lead	mg/kg	1920	1.16
		Zinc	mg/kg	3160	6.98

Page 6 of 6

Mineral Resources On-Line Spatial Data

Counties page > Pb in Conterminous US > Pb in central US > Averages in Allen County

Average concentrations of elements in Allen County, Kansas

(Calculated from cells in the geochemical grid plotting in this area.)

Element	Symbol	Mean	Std. dev.	Minimum	Maximum
Aluminum	Al (wt%)	4.413	0.356	3.830	5.256
Arsenic	As (ppm)	9.808	2.212	6.198	16.217
Calcium	Ca (wt%)	1.298	0.398	0.644	2.742
Copper	Cu (ppm)	10.460	2.418	6.554	16.883
Iron	Fe (wt%)	2.563	0.319	1.906	3.245
Mercury	Hg (ppm)	0.023	0.013	0.010	0.075
Magnesium	Mg (wt%)	0.345	0.051	0.255	0.494
Manganese	Mn (ppm)	1243.820	271.015	789.640	2217.690
Sodium	Na (wt%)	0.527	0.073	0.404	0.750
Phosphorus	P (wt%)	0.049	0.010	0.031	0.077
Lead	Pb (ppm)	27.228	3.922	17.889	46.838
Selenium	Se (ppm)	0.349	0.074	0.203	0.512
Titanium	Ti (wt%)	0.273	0.024	0.224	0.320
Zinc	Zn (ppm)	60.286	6.831	44.630	74.063

Click here to download point data

U.S. Department of the Interior | U.S. Geological Survey
URL: http://tin.er.usgs.gov/geochem/county.php?place=f20001&el=Pb&rf=central
Page Contact Information: pschweitzer@usgs.gov
Page Last modified: 18:07 on 10-Aug-2007

22

Curtis State Office Building
1000 SW Jackson, Suite 410
Topeka, Kansas 66612-1367

Kansas Department of Health and Environment

Preliminary Removal Site Evaluation

For:
United Zinc Smelter #1 Site,
Iola, Allen County, Kansas

September 2005

Site: United Zinc #1
ID # KSN000705026
Break: 1.0
Other: 9-1-2005

40249505
SUPERFUND RECORDS

Preliminary Removal Site Evaluation

United Zinc Smelter #1 Site
Iola, Kansas

Prepared by
Kansas Department of Health and Environment
Bureau of Environmental Remediation
Remedial Section
Site Assessment Program

September 2005

State ID: C3-001-71726
EPA I.D.: Not Yet Assigned

Project Manager: Randolph L. Brown, L.P.G., Professional Geologist IV
Field Support: John Cregan, Environmental Technician
Robert Benne, Geologist Associate I

Table of Contents

1. Introduction 1

2. Site Location and Description..... 1

3. Site Background..... 1

4. Physical Setting..... 2

5. Assessment Activities..... 3

6. Analytical Results..... 4

7. Conclusions..... 5

8. References..... 6

Appendix A – Figures and Tables

Figures:
Figure 1 - Site Area Map and Initial Sample Locations
Figure 2 – McKinley School Sample Locations
Figure 3 – Iola Preschool Sample Locations

Tables:
Table 1 – Laboratory Sample Results
Table 2 - X-Ray Fluorescence (XRF) Results
Table 3 - XRF Quality Control (QC) Results
Table 4 - Regression Parameters

Appendix B - Photographic Record
Appendix C - Laboratory Analytical Reports
Appendix D – Preliminary Removal Site Evaluation Form
Appendix E – United Zinc Phase I Report
Appendix F – United Zinc Phase II Report
Appendix G – United Zinc Residential Sampling Report

This page intentionally left blank

1. INTRODUCTION

The Kansas Department of Health and Environment (KDHE) has an ongoing cooperative agreement with the United States Environmental Protection Agency (USEPA) to conduct assessments of sites pursuant to the Comprehensive Environmental Response, Compensation, and Liabilities Act (CERCLA) consistent with the National Oil and Hazardous Substances Pollution Contingency Plan (NCP). This Preliminary Removal Site Evaluation (PRE) was conducted under this agreement to assess a release or threat of release of hazardous substances, pollutants or contaminants at the former United Zinc Smelter #1 site in Iola, Allen County, Kansas.

Assessment of the site was initiated in response to continued concerns of potential impacts from the former United Zinc smelter works, especially from lead, arsenic, cadmium, and zinc contamination related to the former smelter works.

2. SITE LOCATION AND DESCRIPTION

The United Zinc Smelter # 1 site is approximately centered at the intersection of Kansas Drive and Highway 54 in Iola, Allen County, Kansas. The site is located in a mixed residential/commercial area in the eastern part of Iola. The site is located in Sections 25 and 36, Township 24 South, Range 18 East, Allen County, Kansas. The original United Zinc #1 smelter itself contains approximately 17 acres, but the site includes a much larger surrounding area. Most of the site is now vacant property and some adjacent facilities including Brenntag Southwest, MFA, Superflea Flea Market, Tucker's Flea Market, a concrete mixing facility, and some pastureland. The site is surrounded also by residential areas, and includes two (2) schools, McKinley Elementary School and the Iola Preschool for the Exceptional.

3. SITE BACKGROUND

The earliest plat maps and Sanborn fire insurance maps which indicate activity at the site state that in 1901 the site was the location of the Standard Acid Company. Specific facility operations are described as three (3) furnaces, 12 retorts and a "pottery room" with kilns. William Lanyon owned the property containing the United Zinc site between 1901 and 1902. Lanyon was one of the Lanyon family which constructed, owned and operated many of the early smelter and spelter facilities in Kansas. Lanyon transferred the parcels containing the Smelter #1 site to United Zinc in 1902.

United Zinc and Chemical Company owned and operated the primary zinc smelter at the site until approximately 1912. United Zinc appears to have held the property

until as late as 1925; however no known smelting operations were active at the site after 1912. United Smelter #1 is indicated as having four (4) furnaces, eight (8) kilns, 14 retorts and several associated ore crushers and roasters. The acid chambers from the Standard Acid facility are still noted; it is unknown if these were in use by United Zinc at the #1 facility.

In general, Iola was an international center for zinc and lead smelting until after World War I, with multiple smelters operating in Iola and the adjacent towns of Gas City and La Harpe. The development of shallow natural gas fields in the vicinity of Iola at the end of the 19th century along with rail access precipitated the movement of the smelting industry from primarily coal-fired works in the Pittsburg, Kansas area to areas of abundant natural gas which were much more economical. Most of the zinc smelters in this area provided zinc for galvanizing which was sent to the steel mills of Ohio, Pennsylvania, New Jersey, etc. for processing. While lead was often not the primary metal being smelted, it was smelted as well and while not the primary focus of the smelter production based on the historical market conditions it was often present as waste in the slag material.

4. PREVIOUS INVESTIGATIONS

A Phase I Focused Former Smelter Assessment was completed in December, 2003 for the United Zinc #1 Smelter. The Phase I Assessment was completed by Maxim Technologies under KDHE's State Water Plan (SWP) program. The Phase I Assessment indicated that impact from lead was likely due to the historical activities at the site. The Phase I Report is included as Appendix E.

In December, 2004, the Phase II Assessment was completed for the United Zinc #1 Smelter by Burns and McDonnell, another KDHE SWP contractor. The Phase II indicated lead at a maximum of 49,000 mg/kg; cadmium at 380 mg/kg; arsenic at 1,800 mg/kg; and zinc at 52,000 mg/kg. The elevated arsenic, cadmium, and zinc levels are all generally correlative with elevated lead levels. The Phase II indicated the possibility of elevated lead levels near residential areas as well as the McKinley School and Iola School for the Exceptional. The Phase II Report is included as Appendix F.

In June, 2005, another KDHE SWP contractor, Terranext, collected residential samples between McKinley School and the Iola Preschool for the Exceptional. North of Willow Drive between Vermont Street and Tennessee Street two (2) residential properties were identified as impacted with lead above 400 mg/kg, 303 Tennessee and 304 Vermont.

South of Highway 54, at least 14 residences were identified with one or more lead detections above 400 mg/kg. Seven (7) of these are located on Ohio Street

between Highway 54 and Broadway: 201, 121, 116, 115, 107, 19 and 16 North Ohio Street.

Four (4) of these are located on Tennessee Street between Broadway and Highway 54: 107, 102, 20, and 18 North Tennessee Street. One is located at 24 East Madison Street between Vermont and Tennessee, and two (2) are located on Kentucky Street at 125 and 119 North Kentucky Street. The Residential Yard Sampling Report is included as Appendix G.

5. PHYSICAL SETTING

The site is situated in a mixed residential and commercial area of Iola, Kansas. The site is centered at the intersection of Highway 54 and Tennessee Street No private or public water supply wells are located within one mile of the site.

Relief at the site is low and the site generally slopes towards Rock and Elm Creeks south of the site area. Bedrock in the site area is shallow (less than 20 feet) and consists of limestone and shale beds of the Pennsylvanian Kansas City Group. Soils at the site consist of the Kenoma silt loam with bedrock typically encountered within 5-10 feet.

5. FIELD ACTIVITIES

The PRE was conducted to collect additional sample data from the sensitive receptor areas of McKinley Elementary School ("McKinley") and the Iola School for the Exceptional ("Iola Preschool"). Samples were obtained by removing surficial soils from a 0-6" interval with stainless steel trowels into one-quart freezer bags. The freezer bags were then analyzed on-site with KDHE's Niton Model 733 x-ray fluorescence (XRF) analyzer. Samples were analyzed for a minimum of 30 seconds with a cadmium-109 and americium-241 source. Since no cadmium detections were identified even with the highest lead results, the americium-241 analysis was later dropped.

At McKinley School, an initial grid of 27 sample locations was established. From these initial locations, an additional four (4) deeper samples were also obtained at a depth of of 6"-1'.

An additional 15 sample locations were also added to help laterally delineate areas with surficial lead above 400 mg/kg by XRF analysis.

At Iola Preschool, eight (8) locations were sampled. Since none of the surficial XRF results were above 300 mg/kg, further assessment of extent was not completed.

6. ANALYTICAL RESULTS

The previous results of the Phase II and Residential Yard Sampling Reports have been discussed above, and these are included as appendices to this report as well. At McKinley, an area of lead above 400 mg/kg appears to be present parallel to Kentucky and Neosho Streets.

The maximum XRF and laboratory detections from within the McKinley playground were in the area of M-8 and M-16, located at the base and near the large elm tree at the northwest portion of the playground, and in the sample . In general, from the XRF data, the areas of impacted soil are generally linear and parallel to the streets. Near M-8 and 16, lead levels above 400 and 1,000 mg/kg were identified through XRF screening. It appears the impacted area may extend a minimum of 25 feet east of the western fence into the playground area. In most of the other areas, the impacted zones appear to be within 10-15 feet of the fence.

Deeper samples also indicated XRF elevated detections of lead above 400 mg/kg at locations M3D and M16D.

Laboratory data was in general higher than the XRF data; however all XRF detections below 400 mg/kg were confirmed with laboratory XRF detections below 400 mg/kg. The highest lead XRF result submitted for confirmation, M-8, indicated a maximum level of 939 mg/kg lead, and laboratory results indicated 1,980 mg/kg lead, which was also the highest lead result of those submitted for confirmation. The maximum XRF detection of all analyses was 1,290 mg/kg in M16E10, or 10 feet east of the M-16 location.

A linear regression was calculated for the XRF vs. the limited laboratory lead data obtained at this site. An overall coefficient of correlation of $\mathbf{r^2} = 0.940187$ was calculated for lead analytical results using the maximum of the three bagged analyses vs. the laboratory data, and a value of $\mathbf{r^2} = 0.907012$ was calculated using an average of the three analyses. According to EPA Method 6200, a coefficient of correlation of $0.9 > \mathbf{r^2} > 0.7$ can be considered ***quantitative screening level data,*** or consistent with OA2 level data as established in EPA's *Quality Assurance/Quality Control Guidance for Removal Activities*, EPA 540/G-90/004 of April, 1990. An $\mathbf{r^2} > 0.9$ can be considered definitive level data, if quality assurance/quality control samples and other inferential data are within tolerance. From the collected data, and review of quality control samples, the XRF analyses conducted for this RSE appear to be at a minimum quantitative screening level to definitive level data.

A total of six (6) samples were analyzed during this RSE to determine the percent difference (PD) between the National Institute of Standards and Testing (NIST)

certified arsenic standards and the Niton XRF analyzed value. A maximum PD of 7.9 % was calculated for NIST standard analyses.

The acceptable PD proposed by EPA Method 6200 is 20 %, and therefore the average PD values measured are within EPA Method 6200 acceptance criteria. All XRF analyses conducted for this PRE appear to be at a minimum quantitative screening level data. A rinsate sample collected during decontamination activities indicated low detections of lead (6.56 ug/l) which is not expected to adversely affect overall data quality.

Of the other metals of concern, arsenic was identified at a maximum of 34.5 mg/kg, above its residential RSK level of 11 mg/kg. All laboratory detections of arsenic over the residential RSK were associated with lead results of greater than 400 mg/kg.

7. CONCLUSIONS

Based upon the sampling conducted at the site, it appears especially lead, as well as arsenic, cadmium, and zinc, are present at elevated levels within residential and non-residential properties within the site area as documented in multiple assessments conducted at the site. This PRE has also indicated the presence of lead above 400 mg/kg within the McKinley School play ground and adjacent areas. This area is surrounded by residential properties which are also likely impacted.

Multiple residential properties are impacted as is indicated from the previous SWP investigations. These properties are at a minimum: 303 Tennessee; 304 Vermont; 201, 121, 116, 115, 107, 19 and 16 North Ohio Street; 107, 102, 20, and 18 North Tennessee Street; 24 East Madison Street; and, 125 and 119 North Kentucky Street.

The collective data indicates further removal site evaluation and removal action consideration are appropriate consistent with § 300 of the NCP with the impact of residential yards and the sensitive receptor area of McKinley School.

8. REFERENCES

1. De Lorme Topo Quads, Kansas, 2000.

2. Kansas Department of Health and Environment Files, especially State Water Plan Phase I and II Assessments of the United Zinc Site, and "Residential Soil Sampling Investigation of the United Zinc #1 Site".

3. U.S. Environmental Protection Agency, Office of Solid Waste, Method 6200: *Field Portable X-Ray Fluorescence Spectrometry for the Determination of Elemental Concentrations in Soils and Sediment* (EPA Method 6200), 1998.

4. U.S. Environmental Protection Agency, *Hazard Evaluation Manual: A Guide to Removal Actions*, EPA Region III, 1993.

5. U.S. Environmental Protection Agency, *Quality Assurance/Quality Control Guidance for Removal Activities under CERCLA*, EPA 540/G-90/004, April, 1990.

6. Niton Corporation, *Comparing Field Portable X-Ray Fluorescence (XRF) to Laboratory Analysis of Heavy Metals in Soil*, January, 1997

7. WWC-5 Database, Kansas Department of Health and Environment, 2005.

8. United States Department of Agriculture, Soil Conservation Service, *Soil Survey of Allen County, Kansas*, 1978.

Appendix A: Tables and Figures

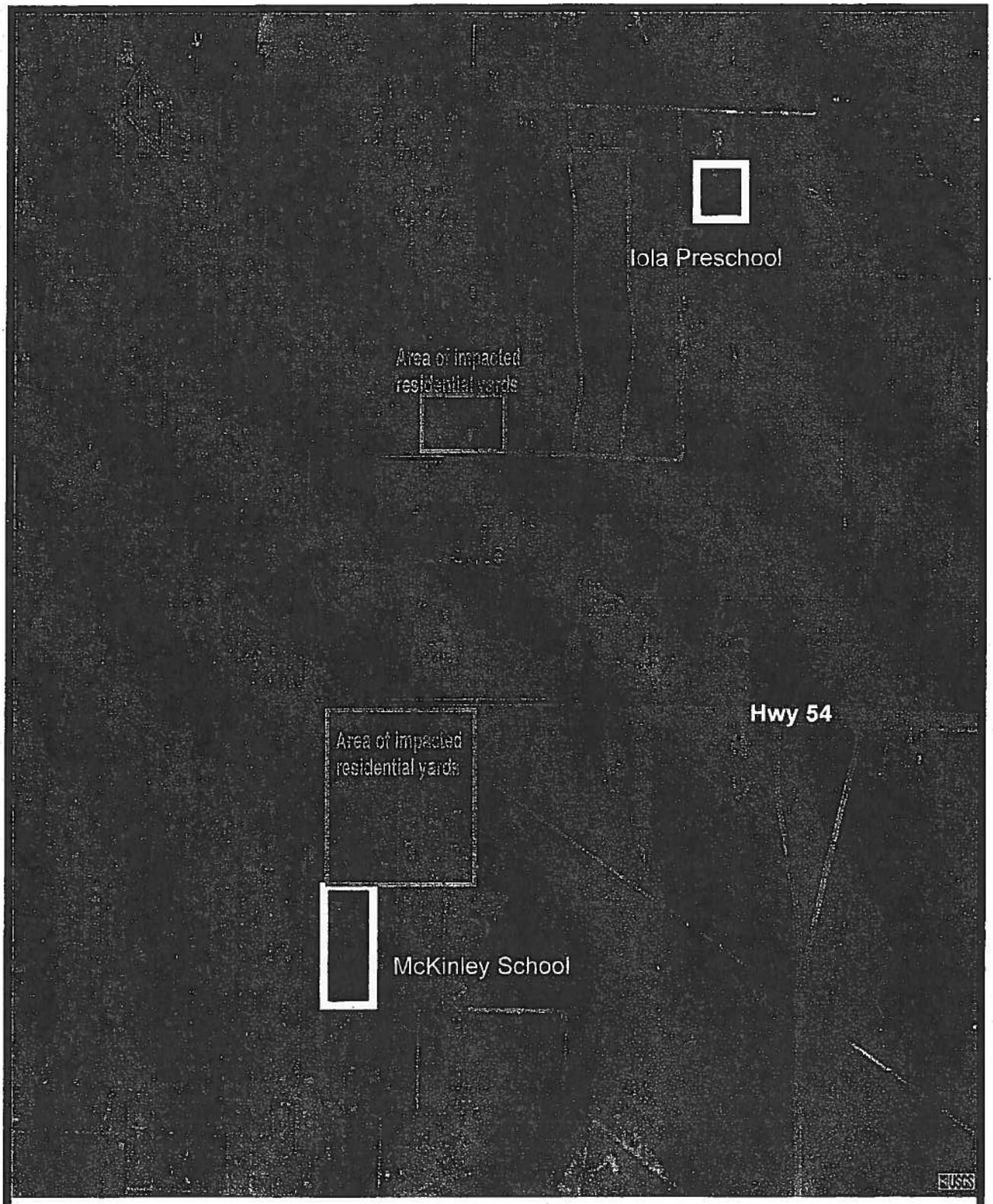
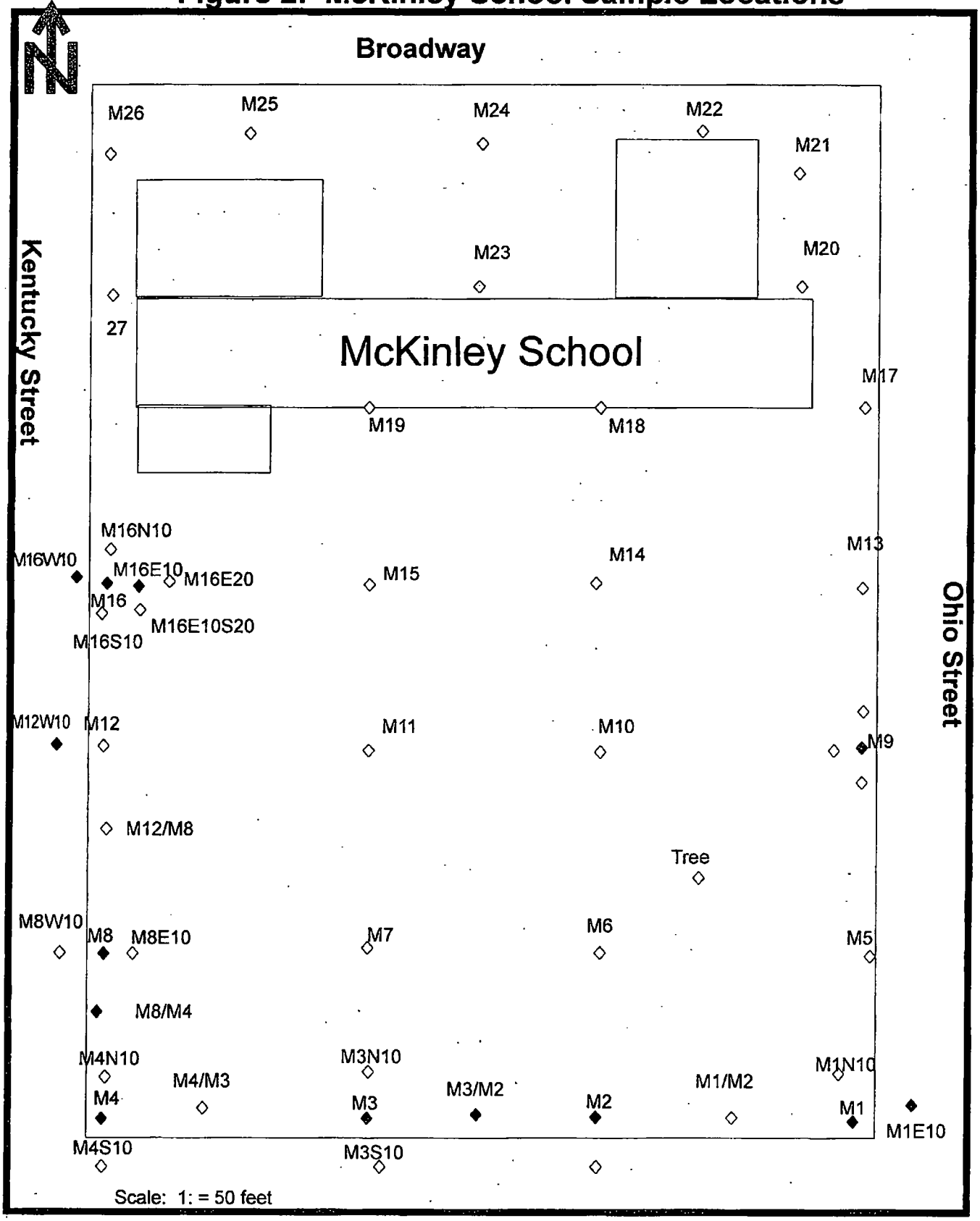


Figure 1: Site Area
United Zinc #1 Site

Scale: 1: 1,000 Feet

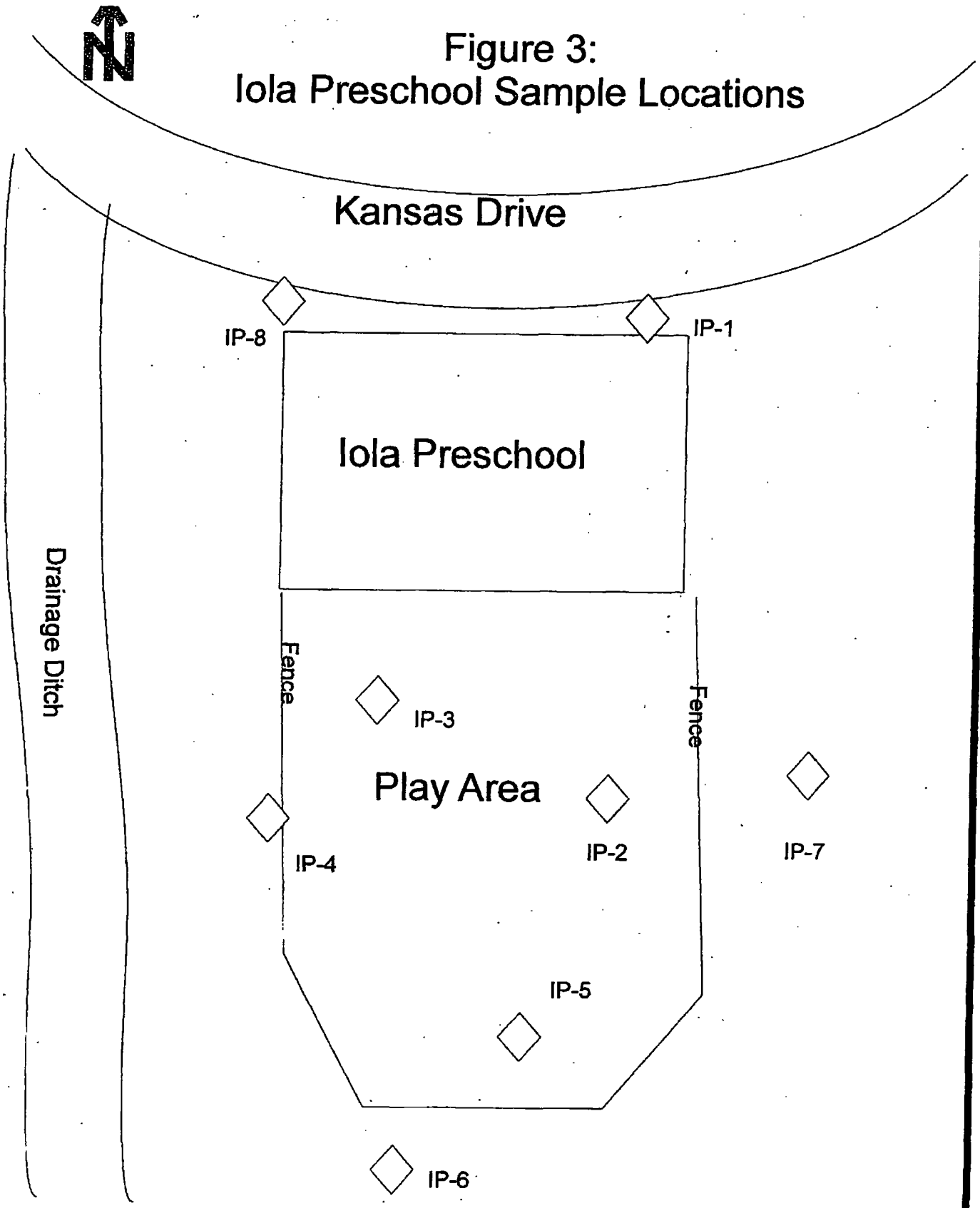
Figure 2: McKinley School Sample Locations



◆ Location with lead at or above 400 mg/kg by either XRF or laboratory anaysis

◇ Location with lead at below 400 mg/kg by either XRF or laboratory anaysis

Figure 3:
Iola Preschool Sample Locations



Scale: 1" = 20 feet

Sample Location (all below 400 mg/kg lead

Table 1: Laboratory Analysis Results

Sample I.D.	Arsenic (mg/kg)	Lead (mg/kg)	Zinc (mg/kg)	Cadmium (mg/kg)
M-1	34.5	558	1,020	4.4
M-3	17.6	936	1,660	6.4
M-4	13.5	768	3,430	6.8
M-8	23.1	1,980	5,870	30.6
M-9	7.5	257	643	2.8
M-16	17.8	1,020	1,420	4.8
M-16D	13.7	609	849	2.4
IP-4	8.8	297	1,040	6.5
Rinsate	ND	6.6 ug/l	ND	ND
Residential RSK	11	400	23,000	39

Note: All analyses completed by Pace Analytical Services, Lenexa, Kansas by EPA Method 6010.

Table 2: X-Ray Fluorescence Results

Sample I.D.	Lead (XRF mg/kg)	Zinc XRF (mg/kg):	Arsenic XRF (mg/kg)	Cadmium XRF (mg/kg)
M-1	414	860	<68	<54
M-1	458	819	<70	<42
M-1	456	872	<68	<55
Ave	443			
Max	458	872		
M-2	119	434	< 39	<53
M-2	109	383	<31	<54
M-2	112	383	< 36	<50
Ave	113			
Max	119	434		
M-3	492	1,230	< 17	<55
M-3	586	1,300	< 23	<49
M-3	570	1,410	< 22	<48
Ave	549			
Max	586	1,410		
M-4	486	1,280	<69	NA
M-4	590	1,440	<64	NA
M-4	494	1,350	<69	NA
Ave.	523			
Max	590	1,440		
M-5	156	540	<46	NA
M-5	170	438	<52	NA
M-5	161	446	<45	NA
Ave	162			
Max	170	540		
M-6	85.5	219	<39	NA
M-6	66.9	162	<38	NA
M-6	67	171	<39	NA
Ave	73			
Max	85.5	219		
M-7	263	794	<52	NA
M-7	335	975	<69	NA

Table 2 (Continued)

Sample I.D.	Lead (XRF mg/kg)	Zinc XRF (mg/kg):	Arsenic XRF (mg/kg)	Cadmium XRF (mg/kg)
M-7	263	738	<58	NA
Ave	287			
Max	335	975		
M-8	939	6,370	<91	<52
M-8	584	3,560	<81	<52
M-8	757	4,010	<85	<52
Ave	760			
Max	939	6,370		
M-9	155	469	<45	NA
M-9	166	427	<41	NA
M-9	163	456	<47	NA
Ave	161			
Max	166	469		
M-10	<19	<47	<22	NA
M-10	36.8		<27	NA
M-10	73.9		<36	NA
Ave	43			
Max	73.9			
M-11	73.4	260	<24	NA
M-11	72.9	234	<26	NA
M-11	74.5	243	<22	NA
Ave	70.3			
Max	74.5	260		
M-12	135	402	<42	NA
M-12	125	374	<49	NA
M-12	115	293	<42	NA
Ave	104.9			
Max	135	402		
M-13	216	464	<48	NA
M-13	209	498	<48	NA
M-13	202	459	<51	NA
Ave	209			
Max	216	498		
M-14	109	205	<37	NA
M-14	125	220	<38	NA
M-14	49.3	86.3	<24	NA
Ave	207.3			
Max	125	220		
M-15	148	377	<43	NA
M-15	152	340	<52	NA
M-15	142	378	<50	NA
Ave	147			
Max	152	378		
M-16	601	790	<70	NA
M-16	622	1,020	<80	NA
M-16	652	970	<81	NA
Ave	625			
Max	652	1,020		
M-17	99.6	304	<15	NA

Table 2 (Continued)

Sample I.D.	Lead (XRF mg/kg)	Zinc XRF (mg/kg):	Arsenic XRF (mg/kg)	Cadmium XRF (mg/kg)
M-17	102	306	<16	NA
M-17	101	224	<14	NA
Ave	101			
Max	102	306		
M-18	111	205	<41	NA
M-18	110	248	<41	NA
M-18	71.6	243	<37	NA
Ave	98			
Max	111	248		
M-19	205	530	<52	NA
M-19	164	390	<62	NA
M-19	201	430	<50	NA
Ave	190			
Max	205	530		
M-20	80	229	<36	NA
M-20	100	229	<41	NA
M-20	67.2	208	<41	NA
Ave	82			
Max	100	208		
M-21	179	450	<45	NA
M-21	132	412	<48	NA
M-21	161	395	<45	NA
Ave	157			
Max	179	450		
M-22	185	464	<44	NA
M-22	177	396	<52	NA
M-22	284	448	<57	NA
Ave	215			
Max	284	464		
M-23	161	387	<40	NA
M-23	145	393	<46	NA
M-23	237	578	<53	NA
Ave	181			
Max	237	578		
M-24	124	331	<46	NA
M-24	90.4	NA	<46	NA
M-24	159	NA	<49	NA
Ave	124			
Max	159	331		
M-25	219	610	<48	NA
M-25	215	504	<57	NA
M-25	279	887	<53	NA
Ave	238			
Max	279	887		
M-26	353	1,040	<62	NA
M-26	335	1,200	<64	NA
M-26	297	962	<55	NA
Ave	328			
Max	353	1,200		

Table 2 (Continued)

Sample I.D.	Lead (XRF mg/kg)	Zinc XRF (mg/kg):	Arsenic XRF (mg/kg)	Cadmium XRF (mg/kg)
M-27	148	408	<45	NA
M-27	113	371	<53	NA
M-27	133	460	<49	NA
Ave	131			
Max	148			
IP-1	226	568	<43	NA
IP-1	138	541	<46	NA
IP-1	220	595	<37	NA
Ave	195			
Max	226	595		
IP-2	145	665	<45	NA
IP-2	196	660	<53	NA
IP-2	219	640	<45	NA
Ave	187			
Max	219	665		
IP-3	122	573	<42	NA
IP-3	127	433	<43	NA
IP-3	118	549	<39	NA
Ave	122			
Max	127			
IP-4	255	687	<49	NA
IP-4	154	627	<44	NA
IP-4	155	603	<43	NA
Ave	188			
Max	255	687		
IP-5	109	439	<40	NA
IP-5	100	280	<49	NA
IP-5	87.3	382	<36	NA
Ave	99			
Max	109			
IP-6	60.5	277	<31	NA
IP-6	58.4	243	<30	NA
IP-6	47.2	262	<27	NA
Ave	55			
Max	60.5	277		
IP-7	155	514	<43	NA
IP-7	155	475	<42	NA
IP-7	157	564	<43	NA
Ave	155			
Max	156			
IP-8	96.7	404	<37	NA
IP-8	87.4	361	<38	NA
IP-8	100	370	<46	NA
Ave	95			
Max	100	404		
M-16D	439	1,310	<81	NA
M-16D	385	770	<81	NA
M-16D	375	757	<70	NA
Ave	400			

Table 2 (Continued)

Sample I.D.	Lead (XRF mg/kg)	Zinc XRF (mg/kg):	Arsenic XRF (mg/kg)	Cadmium XRF (mg/kg)
Max	439	1,310		
M-8D	322	3,300	<47	NA
M-8D	153	1,690	<56	NA
M-8D	258	2,400	<65	NA
Ave	244			
Max	322	3,300		
M-3D	666	1,740	<92	NA
M-3D	500	1,530	<88	NA
M-3D	442	1,240	<83	NA
Ave	536			
Max	666	1,740		
M-16W10	529	2,220	<110	NA
M-16W10	506	2,330	<110	NA
M-16W10	523	2,320	<120	NA
Ave	519			
Max	529	2,330		
M-3N10	328	859	<56	NA
M-3N10	293	904	<56	NA
M-3N10	314	894	<55	NA
Ave	312			
Max	328	904		
M-1N10	166	511	<52	NA
M-1N10	251	524	<59	NA
M-1N10	228	586	<60	NA
Ave	215			
Max	228	596		
M-4N10	162	555	<42	NA
M-4N10	158	486	<42	NA
M-4N10	145	502	<41	NA
Ave	155			
Max	162	555		
M-8E10	204	892	<41	NA
M-8E10	210	910	<52	NA
M-8E10	208	850	<40	NA
Ave	207			
Max	210			
M-16E10	1,290	1,710	<150	NA
M-16E10	1,250	2,080	<150	NA
M-16E10	798	963	<110	NA
Ave	1,099			
Max	1,290	2,080		
M-16S10	132	406	<52	NA
M-16S10	130	427	<49	NA
M-16S10	115	392	<48	NA
Ave	126			
Max	132	427		
M16/M8	135	323	<62	NA
M16/M8	143	397	<74	NA
M16/M8	164	414	<60	NA

Table 2 (Continued)

Sample I.D.	Lead (XRF mg/kg)	Zinc XRF (mg/kg):	Arsenic XRF (mg/kg)	Cadmium XRF (mg/kg)
Ave	147			
Max	164	414		
M8/M4	403	974	<130	NA
M8/M4	332	1,580	<150	NA
M8/M4	381	1,120	<120	NA
Ave	372			
Max	403	1,580		
M4/M3	378	866	<64	NA
M4/M3	352	1,040	<83	NA
M4/M3	317	1,170	<82	NA
Ave	349			
Max	378	1,170		
M3/M2	492	1,080	<82	NA
M3/M2	500	1,280	<85	NA
M3/M2	551	1,220	<85	NA
Ave	514			
Max	551	1,280		
M1/M2	156	506	<49	NA
M1/M2	168	531	<49	NA
M1/M2	173	628	<55	NA
Ave	166			
Max	173	628		
Under Ash Tree (*in situ*)	69.1	422	<72	NA
M16E20	243	471	<67	NA
M16E20	254	335	<74	NA
M16E20	216	431	<61	NA
Ave	238			
Max	254			
M16E10S10	973	1,540	<140	NA
M16E10S10	972	1,600	<140	NA
M16E10S10	1,090	1,520	<130	NA
Ave	1,012			
Max	1,090	1,600		
M16E10S20	271	446	<62	NA
M16E10S20	304	719	<69	NA
M16E10S20	307	569	<70	NA
Ave	294			
Max	307	719		
M16W10	529	2,220	<110	NA
M16W10	506	2,330	<110	NA
M16W10	523	2,320	<120	NA
Ave	519			
Max	529	2,330		
M12W10	526	1,340	<91	NA
M12W10	488	1,410	<86	NA
M12W10	513	1,330	<88	NA
Ave	509			
Max	526	1,410		

Table 2 (Continued)

Sample I.D.	Lead (XRF mg/kg)	Zinc XRF (mg/kg):	Arsenic XRF (mg/kg)	Cadmium XRF (mg/kg)
M8W10	128	937	<78	NA
M8W10	183	810	<71	NA
M8W10	178	916	<77	NA
Ave	163			
Max	183	937		
M4S10	270	1,030	<64	NA
M4S10	282	1,220	<61	NA
M4S10	208	810	<70	NA
Ave	253			
Max	270	1,220		
M3S10	167	692	<44	NA
M3S10	167	657	<48	NA
M3S10	205	658	<54	NA
Ave	180			
Max	205	692		
M1E10	548	1,550	<99	NA
M1E10	498	1,310	<88	NA
M1E10	590	1,530	<100	NA
Ave	545			
Max	590	1,530		

All analyses performed by KDHE using a Niton 733 analyzer with Cd109 source and minimum run time of 30 source seconds consistent with EPA Method 6200. NA- not analyzed

Table 3
XRF Quality Control Samples

A. NIST Standards NIST Sample I.D.	Date	XRF Lead Concentration (mg/kg)	Certified Lead Concentration (mg/kg)	Percent Difference (%D)
High Standard	08/30/05	5,590	5,532	1.0
High Standard	08/30/05	5.560	5,532	0.5
High Standard	08/30/05	5,640	5,532	2.0
High Standard	08/30/05	5,740	5,532	3.8
High Standard	08/30/05	5,600	5,532	1.2
Medium Standard	08/31/05	1,140	1,162	1.9
Medium Standard	08/31/05	1,090	1,162	6.2
B. Duplicate Analysis				
Sample I.D.	Date	XRF Lead Concentration (mg/kg)	Duplicate XRF Lead Concentration (mg/kg)	Percent Difference (%D)
M-5	08/30/05	161	159	1.3
M3/M2	08/31/05	551	516	6.8

Table 5
Parameters for Calculating Linear Regression for Lead

A. Using Maximum Detection Sample ID:	Lead XRF (mg/kg):	Lead Laboratory (mg/kg):
M-1	458	1,020
M-3	586	936
M-4	590	768
M-8	939	1,980
M-9	166	257
M-16	652	1,020
M-16D	439	609
IP-4	255	297
r^2=	**0.940187**	
B. Using Average Detection Sample ID:	Lead XRF (mg/kg):	Lead Laboratory (mg/kg):
M-1	625	1,020
M-3	549	936
M-4	523	768
M-8	760	1,980
M-9	161	257
M-16	625	1,020
M-16D	400	609
IP-4	188	297
r^2=	**0.907012**	

Appendix B: Photographic Record

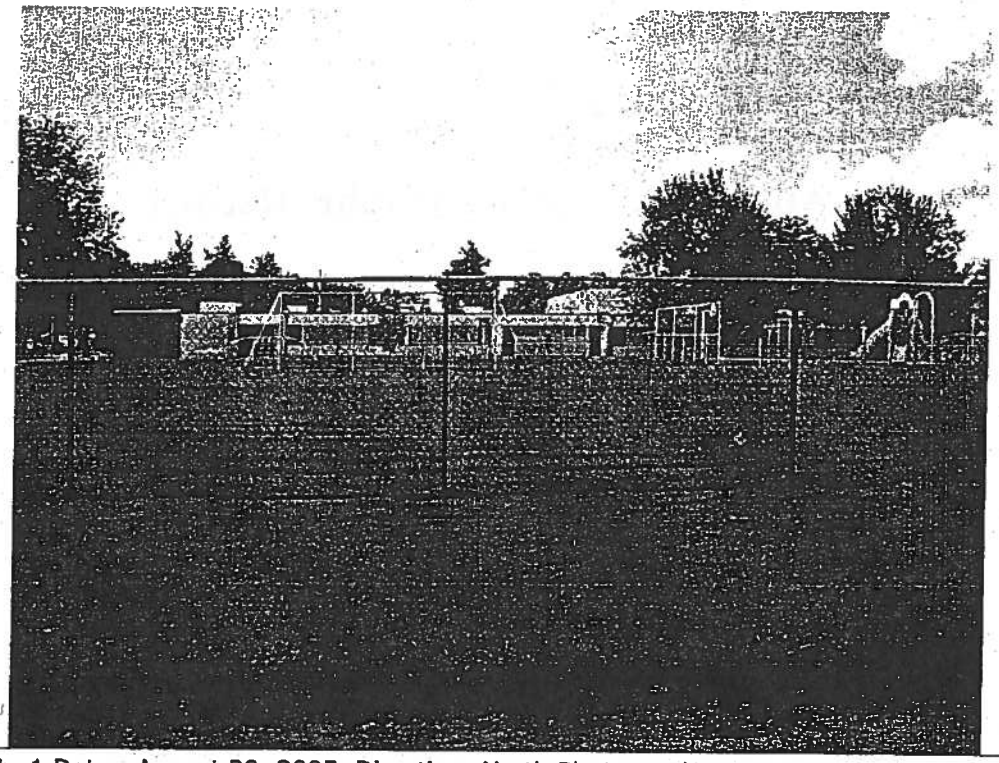


Photo 1 Date: August 30, 2005 Direction: North Photographer: R. Brown Comments: McKinley School playground and school building. Sample location M-3 is visible as white flag.

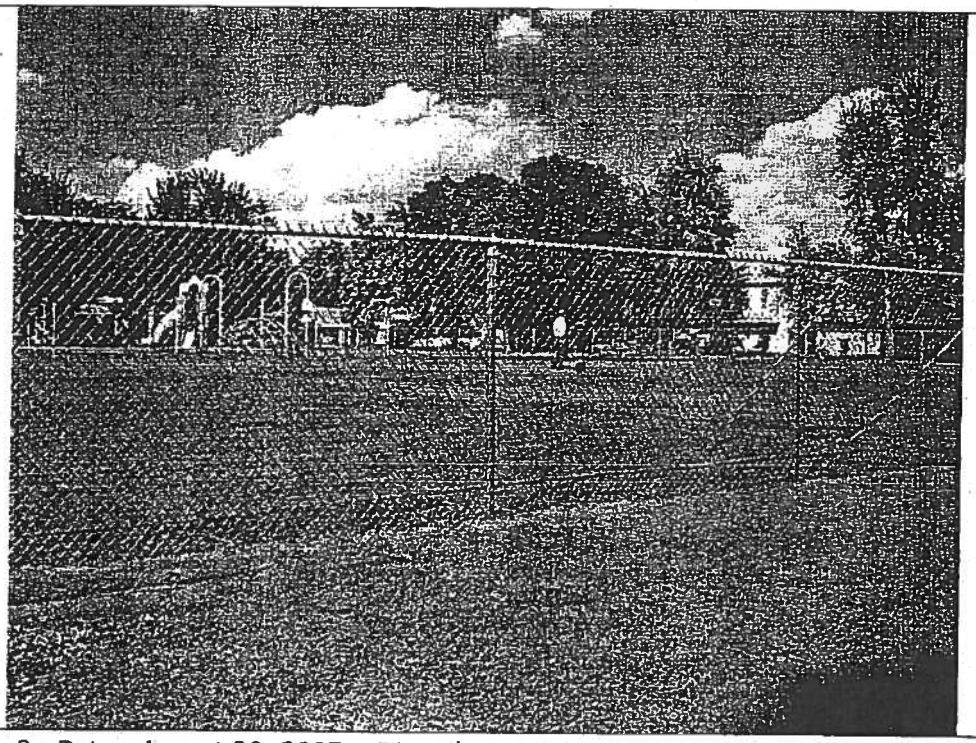


Photo 2 Date: August 30, 2005 Direction: Northeast Photographer: R. Brown Comments: KDHE crew sampling McKinley School playground.

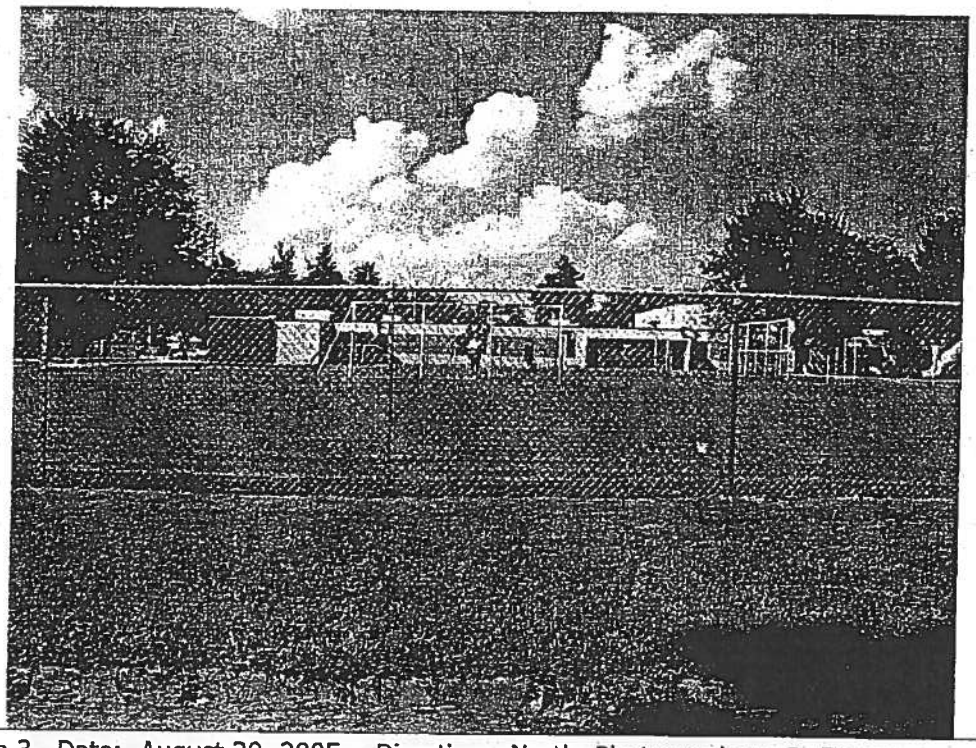


Photo 3 Date: August 30, 2005 Direction: North Photographer: R. Brown
Comments: KDHE crew sampling McKinley School playground.

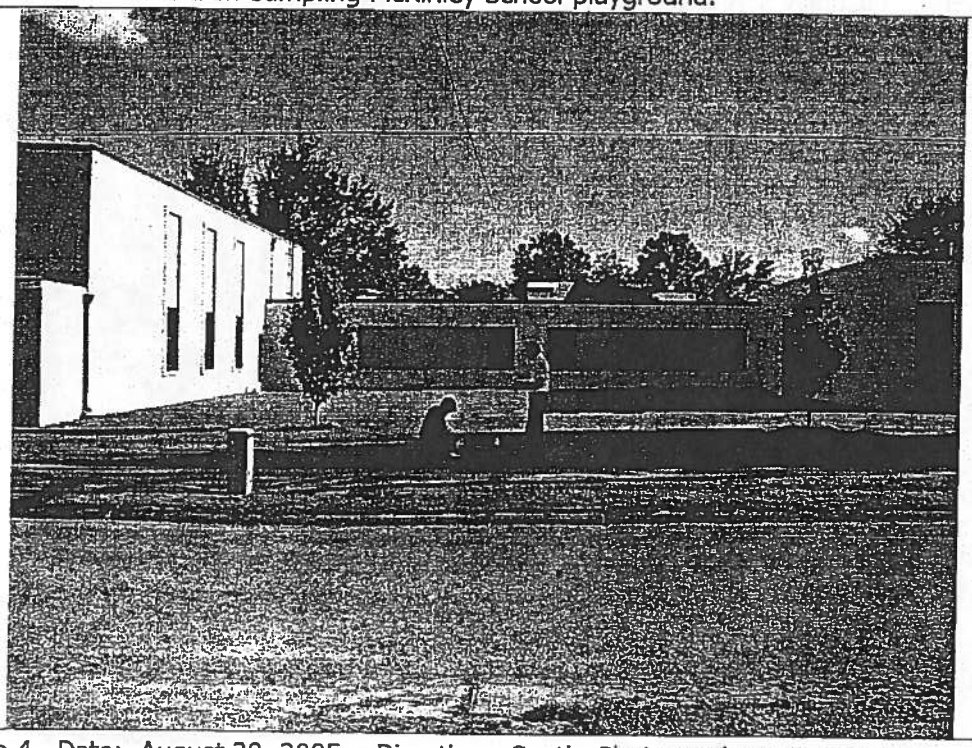


Photo 4 Date: August 30, 2005 Direction: South Photographer: R. Brown
Comments: KDHE crew sampling McKinley School yard near Broadway.

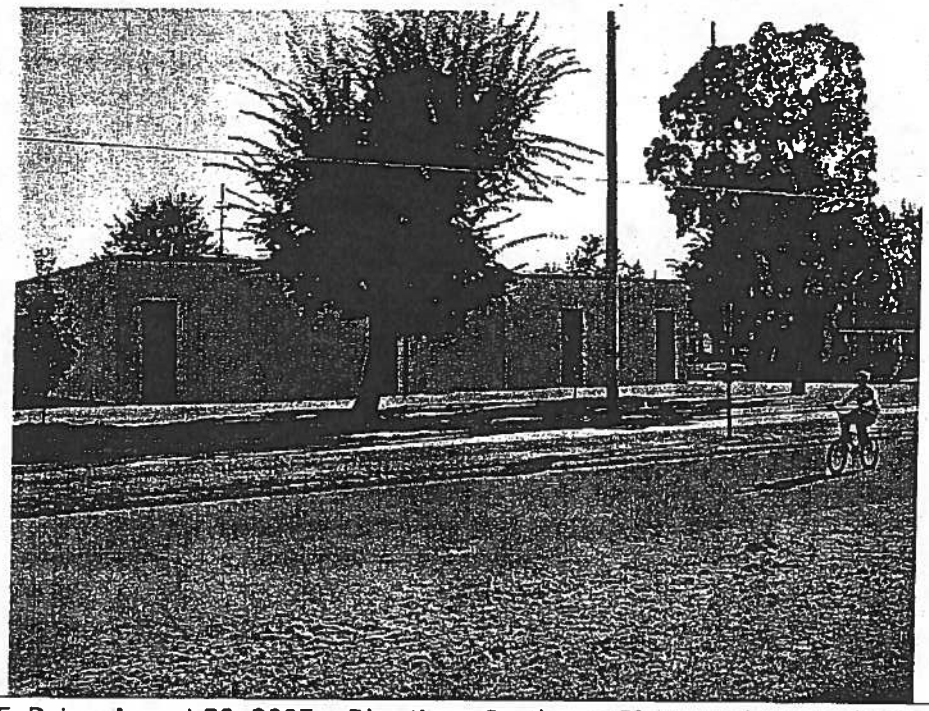


Photo 5 Date: August 30, 2005 Direction: Southwest Photographer: R. Brown
Comments: McKinley School and surrounding residential area.

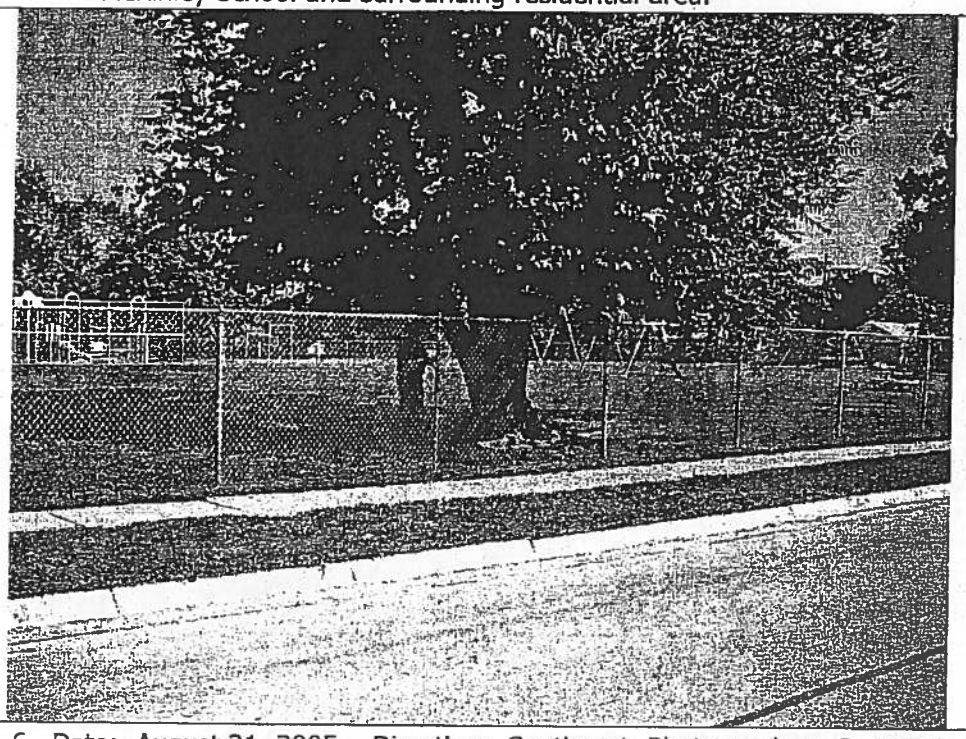


Photo 6 Date: August 31, 2005 Direction: Southeast Photographer: R. Brown
Comments: Large elm tree in McKinley School playground. Soil samples near this location exceeded 1,000 mg/kg lead.

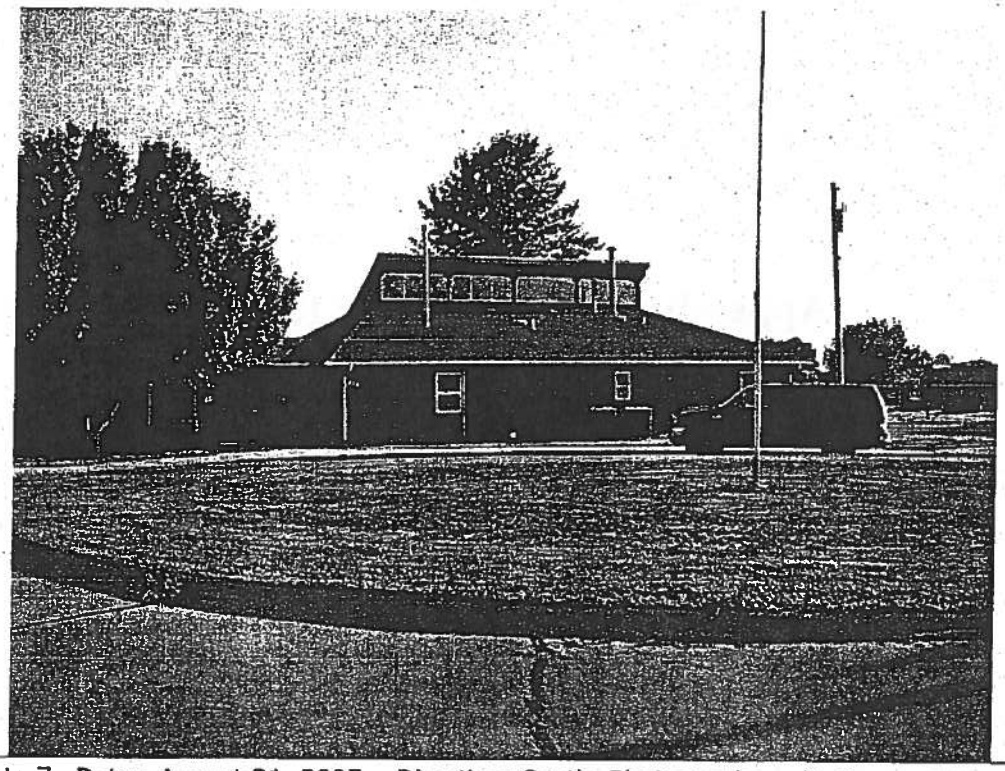


Photo 7 Date: August 31, 2005 Direction: South Photographer: R. Brown
Comments: Front of Iola Preschool

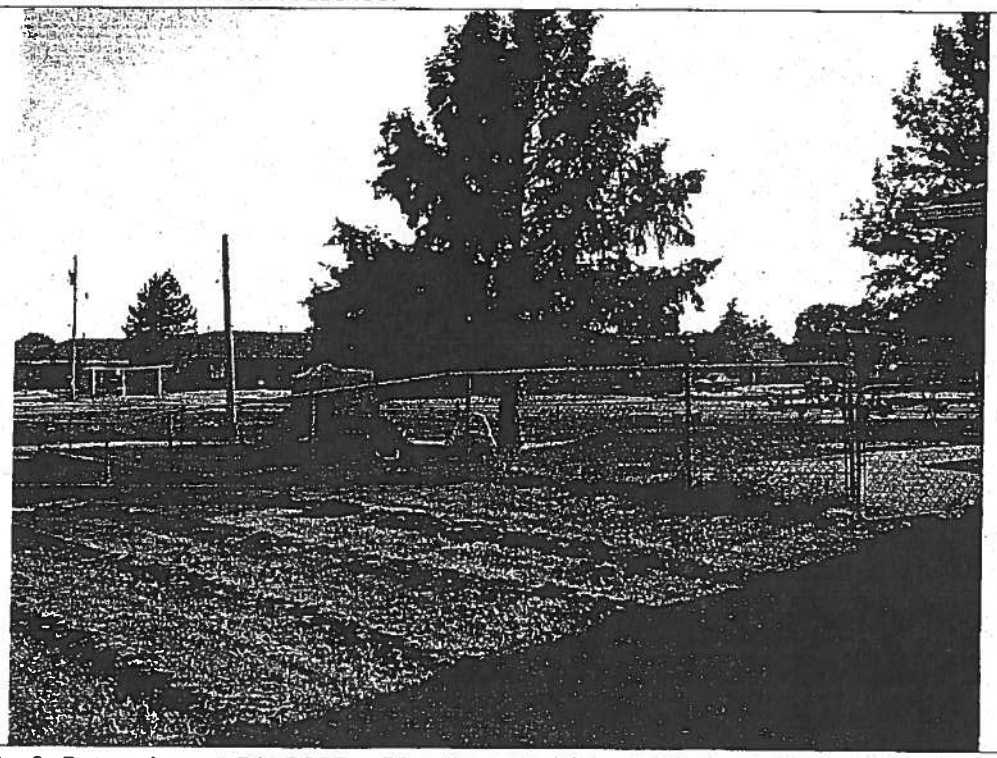


Photo 8 Date: August 31, 2005 Direction: Southwest Photographer: R. Brown
Comments: Playground at Iola Preschool

Appendix C: Laboratory Reports

Pace Analytical™
www.pacelabs.com

Pace Analytical Services, Inc.
9608 Loriet Blvd.
Lenexa, KS 66219
Phone: 913.599.5665
Fax: 913.599.1759

September 06, 2005

Mr. RANDY BROWN
KDHE
1000 SW JACKSON
FOURTH FLOOR
TOPEKA, KS 66612

RE: Lab Project Number: 6099217
Client Project ID: SWP

Dear Mr. BROWN:

Enclosed are the analytical results for sample(s) received by the laboratory on September 1, 2005. Results reported herein conform to the most current NELAC standards, where applicable, unless otherwise narrated in the body of the report.

If you have any questions concerning this report please feel free to contact me.

Sincerely,

Angie Brown
angela.brown@pacelabs.com
Project Manager

Kansas/NELAP Certification Number E-10116

Enclosures

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc.

Pace Analytical
www.pacelabs.com

Pace Analytical Services, Inc.
9608 Loriet Blvd.
Lenexa, KS 66219
Phone: 913.599.5665
Fax: 913.599.1759

SAMPLE SUMMARY

Lab Project Number: 6099217
Client Project ID: SWP

Project Sample Number	Sample Number	Client Sample ID	Matrix	Date Collected	Date Received
6099217-001	608507588	M-16	Soil	08/30/05 16:45	09/01/05 11:45
6099217-002	608507596	IP-4	Soil	08/30/05 19:55	09/01/05 11:45
6099217-003	608507604	M-8	Soil	08/30/05 16:05	09/01/05 11:45
6099217-004	608507612	M-9	Soil	08/30/05 16:25	09/01/05 11:45
6099217-005	608507620	M-3	Soil	08/30/05 16:00	09/01/05 11:45
6099217-006	608507638	M-1	Soil	08/30/05 15:50	09/01/05 11:45
6099217-007	608507646	M-4	Soil	08/30/05 16:05	09/01/05 11:45
6099217-008	608507653	M-16D	Soil	08/30/05 15:55	09/01/05 11:45
6099217-009	608507661	RINSATE	Water	08/30/05 17:15	09/01/05 11:45

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc.

Pace Analytical
www.pacelabs.com

Pace Analytical Services, Inc.
9608 Loriel Blvd.
Lenexa, KS 66219
Phone: 913.599.5665
Fax: 913.599.1759

SAMPLE ANALYTE COUNT

Lab Project Number: 6099217
Client Project ID: SWP

Project Sample Number	Sample No	Client Sample ID	Analysis Code	Analysis Description	Analytes Reported
6099217-001	608507588	M-16	%MOISTURE	Percent Moisture	1
			6010T SPAC	Metals, Trace ICP, Soil	5
6099217-002	608507596	IP-4	%MOISTURE	Percent Moisture	1
			6010T SPAC	Metals, Trace ICP, Soil	5
6099217-003	608507604	M-8	%MOISTURE	Percent Moisture	1
			6010T SPAC	Metals, Trace ICP, Soil	5
6099217-004	608507612	M-9	%MOISTURE	Percent Moisture	1
			6010T SPAC	Metals, Trace ICP, Soil	5
6099217-005	608507620	M-3	%MOISTURE	Percent Moisture	1
			6010T SPAC	Metals, Trace ICP, Soil	5
6099217-006	608507638	M-1	%MOISTURE	Percent Moisture	1
			6010T SPAC	Metals, Trace ICP, Soil	5
6099217-007	608507646	M-4	%MOISTURE	Percent Moisture	1
			6010T SPAC	Metals, Trace ICP, Soil	5
6099217-008	608507653	M-16D	%MOISTURE	Percent Moisture	1
			6010T SPAC	Metals, Trace ICP, Soil	5
6099217-009	608507661	RINSATE	6010T WL60	Metals, Trace ICP, Water	5

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc.

Pace Analytical
www.pacelabs.com

Pace Analytical Services, Inc.
9608 Loriet Blvd.
Lenexa, KS 66219
Phone: 913.599.5665
Fax: 913.599.1759

Lab Project Number: 6099217
Client Project ID: SWP

Solid results are reported on a dry weight basis

Lab Sample No: 608507588 | Project Sample Number: 6099217-001 | Date Collected: 08/30/05 16:45
Client Sample ID: M-16 | Matrix: Soil | Date Received: 09/01/05 11:45

Parameters	Results	Units	Report Limit	DF	Analyzed	By	CAS No.	Qual	RegLmt
Metals									
Metals, Trace ICP, Soil	Prep/Method: EPA 3050 / EPA 6010								
Arsenic	17.8	mg/kg	1.15	1.1	09/02/05 15:53	TJG1	7440-38-2		
Cadmium	4.79	mg/kg	0.576	1.1	09/02/05 15:53	TJG1	7440-43-9		
Lead	1020	mg/kg	0.576	1.1	09/02/05 15:53	TJG1	7439-92-1		
Zinc	1420	mg/kg	11.5	1.1	09/02/05 15:53	TJG1	7440-66-6		
Date Digested	09/02/05				09/02/05				
Organics Prep									
Percent Moisture	Method: SM 2540G								
Percent Moisture	39.3	%		1.0	09/02/05	JDM			

Date: 09/06/05

REPORT OF LABORATORY ANALYSIS
This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc.

Pace Analytical
www.pacelabs.com

Pace Analytical Services, Inc.
9608 Loriet Blvd.
Lenexa, KS 66219
Phone: 913.599.5665
Fax: 913.599.1759

Lab Project Number: 6099217
Client Project ID: SWP

Lab Sample No: 608507604 | Project Sample Number: 6099217-003 | Date Collected: 08/30/05 16:05
Client Sample ID: M-8 | Matrix: Soil | Date Received: 09/01/05 11:45

Parameters	Results	Units	Report Limit	DF	Analyzed	By	CAS No.	Qual	RegLmt
Metals									
Metals, Trace ICP, Soil	Prep/Method: EPA 3050 / EPA 6010								
Arsenic	23.1	mg/kg	1.45	1.4	09/02/05 16:15	TJG1	7440-38-2		
Cadmium	30.6	mg/kg	0.725	1.4	09/02/05 16:15	TJG1	7440-43-9		
Lead	1980	mg/kg	0.725	1.4	09/02/05 16:15	TJG1	7439-92-1		
Zinc	5870	mg/kg	363.	36.3	09/02/05 17:54	TJG1	7440-66-6		
Date Digested	09/02/05				09/02/05				
Organics Prep									
Percent Moisture	Method: SM 2540G								
Percent Moisture	35.0	%		1.0	09/02/05	JDM			

REPORT OF LABORATORY ANALYSIS
This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc.

Pace Analytical
www.pacelabs.com

Pace Analytical Services, Inc.
9608 Loriet Blvd.
Lenexa, KS 66219
Phone: 913.599.5665
Fax: 913.599.1759

Lab Project Number: 6099217
Client Project ID: SWP

Lab Sample No: 608507596
Client Sample ID: IP-4

Project Sample Number: 6099217-002
Matrix: Soil

Date Collected: 08/30/05 19:55
Date Received: 09/01/05 11:45

Parameters	Results	Units	Report Limit	DF	Analyzed	By	CAS No.	Qual	RegLmt
Metals									
Metals, Trace ICP, Soil	Prep/Method: EPA 3050 / EPA 6010								
Arsenic	8.83	mg/kg	0.990	1.0	09/02/05 16:09	TJG1	7440-38-2		
Cadmium	6.50	mg/kg	0.495	1.0	09/02/05 16:09	TJG1	7440-43-9		
Lead	297.	mg/kg	0.495	1.0	09/02/05 16:09	TJG1	7439-92-1		
Zinc	1040	mg/kg	99.0	9.9	09/02/05 17:50	TJG1	7440-66-6		
Date Digested	09/02/05				09/02/05				
Organics Prep									
Percent Moisture	Method: SM 2540G								
Percent Moisture	19.2	%		1.0	09/02/05	JDM			

Date: 09/06/05

REPORT OF LABORATORY ANALYSIS
This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc

Pace Analytical
www.pacelabs.com

Pace Analytical Services, Inc.
9608 Loriet Blvd.
Lenexa, KS 66219
Phone: 913.599.5665
Fax: 913.599.1759

Lab Project Number: 6099217
Client Project ID: SWP

Lab Sample No: 608507612 | Project Sample Number: 6099217-004 | Date Collected: 08/30/05 16:25
Client Sample ID: M-9 | Matrix: Soil | Date Received: 09/01/05 11:45

Parameters	Results	Units	Report Limit	DF	Analyzed	By	CAS No.	Qual	RegLmt
Metals									
Metals, Trace ICP, Soil	Prep/Method: EPA 3050 / EPA 6010								
Arsenic	7.48	mg/kg	1.02	1.0	09/02/05 16:21	TJG1	7440-38-2		
Cadmium	2.83	mg/kg	0.508	1.0	09/02/05 16:21	TJG1	7440-43-9		
Lead	257.	mg/kg	0.508	1.0	09/02/05 16:21	TJG1	7439-92-1		
Zinc	643.	mg/kg	10.2	1.0	09/02/05 16:21	TJG1	7440-66-6		
Date Digested	09/02/05				09/02/05				
Organics Prep									
Percent Moisture	Method: SM 2540G								
Percent Moisture	24.3	%		1.0	09/02/05	JDM			

REPORT OF LABORATORY ANALYSIS
This report shall not be reproduced, except in full, without the written consent of Pace Analytical Services, Inc.

Pace Analytical™
www.pacelabs.com

Pace Analytical Services, Inc.
9608 Loiret Blvd.
Lenexa, KS 66219
Phone: 913.599.5665
Fax: 913.599.1759

Lab Project Number: 6099217
Client Project ID: SWP

Lab Sample No: 608507620 | Project Sample Number: 6099217-005 | Date Collected: 08/30/05 16:00
Client Sample ID: M-3 | Matrix: Soil | Date Received: 09/01/05 11:45

Parameters	Results	Units	Report Limit	DF	Analyzed	By	CAS No.	Qual	RegLmt
Metals									
Metals, Trace ICP, Soil	Prep/Method: EPA 3050 / EPA 6010								
Arsenic	17.6	mg/kg	1.25	1.2	09/02/05 16:26	TJG1	7440-38-2		
Cadmium	6.43	mg/kg	0.623	1.2	09/02/05 16:26	TJG1	7440-43-9		
Lead	936.	mg/kg	0.623	1.2	09/02/05 16:26	TJG1	7439-92-1		
Zinc	1660	mg/kg	125.	12.5	09/02/05 17:58	TJG1	7440-66-6		
Date Digested	09/02/05				09/02/05				
Organics Prep									
Percent Moisture	Method: SM 2540G								
Percent Moisture	22.0	%		1.0	09/02/05	JDM			

Date: 09/06/05

REPORT OF LABORATORY ANALYSIS
This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc.

Pace Analytical™
www.pacelabs.com

Pace Analytical Services, Inc.
9608 Loriet Blvd.
Lenexa, KS 66219
Phone: 913.599.5665
Fax: 913.599.1759

Lab Project Number: 6099217
Client Project ID: SWP

Lab Sample No: 608507638 | Project Sample Number: 6099217-006 | Date Collected: 08/30/05 15:50
Client Sample ID: M-1 | Matrix: Soil | Date Received: 09/01/05 11:45

Parameters	Results	Units	Report Limit	DF	Analyzed	By	CAS No.	Qual	RegLmt
Metals									
Metals, Trace ICP, Soil	Prep/Method: EPA 3050 / EPA 6010								
Arsenic	34.5	mg/kg	1.04	1.0	09/02/05 16:50	TJG1	7440-38-2		
Cadmium	4.37	mg/kg	0.521	1.0	09/02/05 16:50	TJG1	7440-43-9		
Lead	558.	mg/kg	0.521	1.0	09/02/05 16:50	TJG1	7439-92-1		
Zinc	1020	mg/kg	10.4	1.0	09/02/05 16:50	TJG1	7440-66-6		
Date Digested	09/02/05				09/02/05				
Organics Prep									
Percent Moisture	Method: SM 2540G								
Percent Moisture	21.3	%		1.0	09/02/05	JDM			

REPORT OF LABORATORY ANALYSIS
This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc.

Pace Analytical™
www.pacelabs.com

Pace Analytical Services, Inc.
9608 Loriet Blvd.
Lenexa, KS 66219
Phone: 913.599.5665
Fax: 913.599.1759

Lab Project Number: 6099217
Client Project ID: SWP

Lab Sample No: 608507646 | Project Sample Number: 6099217-007 | Date Collected: 08/30/05 16:05
Client Sample ID: M-4 | Matrix: Soil | Date Received: 09/01/05 11:45

Parameters	Results	Units	Report Limit	DF	Analyzed	By	CAS No.	Qual	RegLmt
Metals									
Metals, Trace ICP, Soil	Prep/Method: EPA 3050 / EPA 6010								
Arsenic	13.5	mg/kg	1.24	1.2	09/02/05 16:56	TJG1	7440-38-2		
Cadmium	6.77	mg/kg	0.620	1.2	09/02/05 16:56	TJG1	7440-43-9		
Lead	768.	mg/kg	0.620	1.2	09/02/05 16:56	TJG1	7439-92-1		
Zinc	3430	mg/kg	124.	12.4	09/02/05 18:03	TJG1	7440-66-6		
Date Digested	09/02/05				09/02/05				
Organics Prep									
Percent Moisture	Method: SM 2540G								
Percent Moisture	26.1	%		1.0	09/02/05	JDM			

Date: 09/06/05

REPORT OF LABORATORY ANALYSIS
This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc.

Pace Analytical
www.pacelabs.com

Pace Analytical Services, Inc.
9608 Loriet Blvd.
Lenexa, KS 66219
Phone: 913.599.5665
Fax: 913.599.1759

Lab Project Number: 6099217
Client Project ID: SWP

Lab Sample No: 608507653 | Project Sample Number: 6099217-008 | Date Collected: 08/30/05 15:55
Client Sample ID: M-16D | Matrix: Soil | Date Received: 09/01/05 11:45

Parameters	Results	Units	Report Limit	DF	Analyzed	By	CAS No.	Qual	ReqLmt
Metals									
Metals, Trace ICP, Soil	Prep/Method: EPA 3050 / EPA 6010								
Arsenic	13.7	mg/kg	1.02	1.0	09/02/05 17:01	TJG1	7440-38-2		
Cadmium	2.44	mg/kg	0.510	1.0	09/02/05 17:01	TJG1	7440-43-9		
Lead	609.	mg/kg	0.510	1.0	09/02/05 17:01	TJG1	7439-92-1		
Zinc	849.	mg/kg	10.2	1.0	09/02/05 17:01	TJG1	7440-66-6		
Date Digested	09/02/05				09/02/05				
Organics Prep									
Percent Moisture	Method: SM 2540G								
Percent Moisture	21.0	%		1.0	09/02/05	JDM			

Date: 09/06/05

Page: 8 of 15

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc.

Pace Analytical
www.pacelabs.com

Pace Analytical Services, Inc.
9608 Loriet Blvd.
Lenexa, KS 66219
Phone: 913.599.5665
Fax: 913.599.1759

Lab Project Number: 6099217
Client Project ID: SWP

Lab Sample No: 608507661
Client Sample ID: RINSATE

Project Sample Number: 6099217-009
Matrix: Water

Date Collected: 08/30/05 17:15
Date Received: 09/01/05 11:45

Parameters	Results	Units	Report Limit	DF	Analyzed	By	CAS No.	Qual	RegLmt
Metals									
Metals, Trace ICP, Water	Prep/Method: EPA 3010 / EPA 6010								
Arsenic	ND	ug/l	10.0	1.0	09/02/05 15:09	TJG1	7440-38-2		
Cadmium	ND	ug/l	5.00	1.0	09/02/05 15:09	TJG1	7440-43-9		
Lead	6.56	ug/l	5.00	1.0	09/02/05 15:09	TJG1	7439-92-1		
Selenium	ND	ug/l	15.0	1.0	09/02/05 15:09	TJG1	7782-49-2		
Date Digested	09/01/05				09/01/05				

REPORT OF LABORATORY ANALYSIS
This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc.

Pace Analytical™
www.pacelabs.com

Pace Analytical Services, Inc.
9608 Loriet Blvd.
Lenexa, KS 66219
Phone: 913.599.5665
Fax: 913.599.1759

Lab Project Number: 6099217
Client Project ID: SWP

PARAMETER FOOTNOTES

Dilution factor shown represents the factor applied to the reported result and reporting limit due to changes in sample preparation, dilution of the extract, or moisture content

ND	Not detected at or above adjusted reporting limit
NC	Not Calculable
J	Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit
MDL	Adjusted Method Detection Limit

REPORT OF LABORATORY ANALYSIS
This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc.

Pace Analytical
www.pacelabs.com

Pace Analytical Services, Inc.
9608 Loriet Blvd.
Lenexa, KS 66219
Phone: 913.599.5665
Fax: 913.599.1759

QUALITY CONTROL DATA

Lab Project Number: 6099217
Client Project ID: SWP

QC Batch: 202595
QC Batch Method: EPA 3010
Associated Lab Samples: 608507661

Analysis Method: EPA 6010
Analysis Description: Metals, Trace ICP, Water

METHOD BLANK: 608509600
Associated Lab Samples: 608507661

Parameter	Units	Blank Result	Reporting Limit	Footnotes
Arsenic	ug/l	ND	10.0	
Cadmium	ug/l	ND	5.00	
Lead	ug/l	ND	5.00	
Selenium	ug/l	ND	15.0	

LABORATORY CONTROL SAMPLE: 608509618

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Footnotes
Arsenic	ug/l	1000.00	1041	104	80-120	
Cadmium	ug/l	100.00	102.4	102	80-120	
Lead	ug/l	1000.00	1058	106	80-120	
Selenium	ug/l	1000.00	982.2	98	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 608509626 608509634

Parameter	Units	608507661 Result	Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Footnotes
Arsenic	ug/l	0	1000.00	1036	1048	104	105	75-125	1		
Cadmium	ug/l	0	100.00	104.1	103.4	104	103	75-125	1		
Lead	ug/l	6.562	1000.00	1055	1065	105	106	75-125	1		
Selenium	ug/l	1.417	1000.00	954.0	967.6	95	97	75-125	1		

REPORT OF LABORATORY ANALYSIS
This report shall not be reproduced, except in full, without the written consent of Pace Analytical Services, Inc.

Pace Analytical
www.pacelabs.com

Pace Analytical Services, Inc.
9608 Loriet Blvd.
Lenexa, KS 66219
Phone: 913.599.5665
Fax: 913.599.1759

QUALITY CONTROL DATA

Lab Project Number: 6099217
Client Project ID: SWP

QC Batch: 202612 — Analysis Method: EPA 6010
QC Batch Method: EPA 3050 — Analysis Description: Metals, Trace ICP, Soil
Associated Lab Samples: 608507588 608507596 608507604 608507612 608507620 608507638 608507646 608507653

METHOD BLANK: 608511309
Associated Lab Samples: 608507588 608507596 608507604 608507612 608507620 608507638 608507646 608507653

Parameter	Units	Blank Result	Reporting Limit	Footnotes
Arsenic	mg/kg	ND	1.00	
Cadmium	mg/kg	ND	0.500	
Lead	mg/kg	ND	0.500	
Zinc	mg/kg	ND	10.0	

LABORATORY CONTROL SAMPLE: 608511317

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Footnotes
Arsenic	mg/kg	76.92	80.10	104	80-120	
Cadmium	mg/kg	7.692	8.052	105	80-120	
Lead	mg/kg	76.92	81.78	106	80-120	
Zinc	mg/kg	76.92	79.00	103	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 608511325 608511333

Parameter	Units	608507588 Result	Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Footnotes
Arsenic	mg/kg	17.83	124.90	126.2	149.3	87	101	75-125	17		
Cadmium	mg/kg	4.787	12.49	13.97	16.25	74	88	75-125	15		
Lead	mg/kg	1025	124.90	956.9	1268	0	188	75-125	28		
Zinc	mg/kg	1422	124.90	1358	1620	0	152	75-125	18		

REPORT OF LABORATORY ANALYSIS
This report shall not be reproduced, except in full, without the written consent of Pace Analytical Services, Inc.

Pace Analytical
www.pacelabs.com

Pace Analytical Services, Inc.
9608 Loriet Blvd.
Lenexa, KS 66219
Phone: 913.599.5665
Fax: 913.599.1759

QUALITY CONTROL DATA

Lab Project Number: 6099217
Client Project ID: SWP

QC Batch: 202622 Analysis Method: SM 2540G
QC Batch Method: SM 2540G Analysis Description: Percent Moisture
Associated Lab Samples: 608507588 608507596 608507604 608507612 608507620 608507638 608507646 608507653

SAMPLE DUPLICATE: 608511648

Parameter	Units	608511176 Result	DUP Result	RPD	RPD	Footnotes
Percent Moisture	%	17.60	20.50	15		

Date: 09/06/05

REPORT OF LABORATORY ANALYSIS
This report shall not be reproduced, except in full, without the written consent of Pace Analytical Services, Inc.

Pace Analytical™
www.pacelabs.com

Pace Analytical Services, Inc.
9608 Loriet Blvd.
Lenexa, KS 66219
Phone: 913.599.5665
Fax: 913.599.1759

Lab Project Number: 6099217
Client Project ID: SWP

QUALITY CONTROL DATA PARAMETER FOOTNOTES

Consistent with EPA guidelines, unrounded concentrations are displayed and have been used to calculate % Rec and RPD values.

LCS(D)	Laboratory Control Sample (Duplicate)
MS(D)	Matrix Spike (Duplicate)
DUP	Sample Duplicate
ND	Not detected at or above adjusted reporting limit
NC	Not Calculable
J	Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit
MDL	Adjusted Method Detection Limit
RPD	Relative Percent Difference

REPORT OF LABORATORY ANALYSIS
This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc.

Pace Analytical
www.pacelabs.com

Pace Analytical Services, Inc.
9608 Loriet Blvd.
Lenexa, KS 66219
Phone: 913.599.5665
Fax: 913.599.1759

QUALITY CONTROL DATA

CROSS REFERENCE TABLE

Lab Project Number: 6099217
Client Project ID: SWP

Lab Sample No Identifier	Client Sample Identifier	QC Batch Method	QC Batch Identifier	Analytical Method	Analytical Batch Identifier
608507661	RINSATE	EPA 3010	202595	EPA 6010	202701
608507588	M-16	EPA 3050	202612	EPA 6010	202700
608507596	IP-4	EPA 3050	202612	EPA 6010	202700
608507604	M-8	EPA 3050	202612	EPA 6010	202700
608507612	M-9	EPA 3050	202612	EPA 6010	202700
608507620	M-3	EPA 3050	202612	EPA 6010	202700
608507638	M-1	EPA 3050	202612	EPA 6010	202700
608507646	M-4	EPA 3050	202612	EPA 6010	202700
608507653	M-16D	EPA 3050	202612	EPA 6010	202700
608507588	M-16	SM 2540G	202622		
608507596	IP-4	SM 2540G	202622		
608507604	M-8	SM 2540G	202622		
608507612	M-9	SM 2540G	202622		
608507620	M-3	SM 2540G	202622		
608507638	M-1	SM 2540G	202622		
608507646	M-4	SM 2540G	202622		
608507653	M-16D	SM 2540G	202622		

Date: 09/06/05

REPORT OF LABORATORY ANALYSIS
This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc.

Pace Analytical™
www.pacelabs.com

CHAIN OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

688067

Page: 1 of 1

Section A — Required Client Information:

Company	KDHE
Address	200 SW Jackson Topeka, KS 66612
Phone	785-296-7065
Fax	785-296-7030

Section B — Required Client Information:

Report To:	Raid, Brown
Copy To:	
Invoice To:	Teresa Hatton
P.O.	
Project Name:	SWP
Project Number:	

Client Information (Check quote/contract):

Requested Due Date: 09/01/05 *TAT:

* Turn around times less than 14 days subject to laboratory and contractual obligations and may result in a Rush Turnaround Surcharge.
Turn Around Time (TAT) in calendar days.

Section C — To Be Completed by Pace Analytical and Client

Quote Reference:	
Project Manager:	
Project #:	
Profile #:	

Section D — Required Client Information:

SAMPLE ID
One character per box.
(A–Z, 0–9 / .–)
Sample IDs MUST BE UNIQUE

Valid Matrix Codes

MATRIX	CODE
WATER	WT
SOIL	SL
OIL	OL
WIPE	WP
AIR	AR
TISSUE	TS
OTHER	OT

Requested Analysis: Cd 6010, As 6010, Pb 6010, Zn 6010

ITEM #	SAMPLE ID	MATRIX CODE	DATE COLLECTED (mm / dd / yy)	TIME COLLECTED (hh:mm a/p)	# Containers	Unpreserved	H_2SO_4	HNO_3	HCl	NaOH	$Na_2S_2O_3$	Methanol	Other	Cd 6010	As 6010	Pb 6010	Zn 6010	Remarks / Lab ID
1	M-16	SL	08/30/05	1145	1									X	X	X	X	
2	IP-4	SL	08/30/05	1755	1									X	X	X	X	
3	~~M-16D~~ M-8	SL	08/30/05	1605	1									X	X	X	X	
4	M-9	SL	08/30/05	1625	1									X	X	X	X	
5	M-3	SL	08/30/05	1600	1									X	X	X	X	
6	M-1	SL	08/30/05	1550	1									X	X	X	X	
7	M-4	SL	08/30/05	1605	1									X	X	X	X	
8	M-16D	SL	08/31/05	1555	1									X	X	X	X	
9	Rinsate	WT	08/30/05	1715	1			X						X	X	X	X	
10																		
11																		
12																		

SHIPMENT METHOD	AIRBILL NO.	SHIPPING DATE	NO. OF COOLERS	ITEM NUMBER	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME
					[illegible]	9-1-05	11:45	[illegible]	9/1/05	

SAMPLE CONDITION

Temp in °C	SL
Received on Ice	Y/N
Sealed Cooler	Y/N
Samples Intact	Y/N

SAMPLE NOTES

Additional Comments:

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: John [illegible]

SIGNATURE of SAMPLER: [illegible] KDHE

DATE Signed: (MM / DD / YY) 9-1-05

SEE REVERSE SIDE FOR INSTRUCTIONS

Page 47 of 56

Appendix D: Preliminary Removal Evaluation (PRE) Form

KANSAS DEPARTMENT OF HEALTH AND ENVIRONMENT
BUREAU OF ENVIRONMENTAL REMEDIATION

PRELIMINARY REMOVAL SITE EVALUATION/ REMOVAL PRELIMINARY ASSESSMENT FORM

I. SITE NAME AND LOCATION

NAME:	United Zinc #1 Site				
ADDRESS OR OTHER LOCATION IDENTIFIER:			**Kentucky and East Highway 54**		
CITY:	Iola	**COUNTY:** Allen	**STATE:** Kansas	**ZIP:**	66749
TELEPHONE:			**FAX:**		
DIRECTIONS TO SITE:			**MAP ATTACHED:**		X

The site is located in Iola north and south of Highway 54 between Kentucky Street and Eisenhower Drive to the north and Eleventh Street to the south, Sections 25 and 36, Township 24 South, Range 18 East, Allen County, Kansas.

II. SITE REFERRAL INFORMATION:

REQUESTED BY:	KDHE	**DATE OF REQUEST:**	08/05
AGENCY/OFFICE:			
MAILING ADDRESS:			
CITY:		**STATE:**	**ZIP:**
TELEPHONE:		**FAX:**	
SITE CONTACT:			
AGENCY/OFFICE:			
MAILING ADDRESS:			
CITY:		**STATE:**	**ZIP:**
TELEPHONE:		**FAX:**	

DEFINITION OF TERMS

ATSDR is the Agency for Toxic Substances and Disease Registry.

CERCLA is the Comprehensive Environmental Response Compensation and Liabilities Act, 42 USC §9601 et seq. (as amended).

A **FACILITY** is defined as any building, structure, installation, equipment, pipe or pipeline (including any pipe into a sewer or publicly-owned treatment works (POTW), well, pit, pond, lagoon, impoundment, ditch, landfill, storage container, motor vehicle, rolling stock, or aircraft or any site or area, where a hazardous substance has been deposited, stored, disposed of, or placed, or otherwise come to be located; but does not include any consumer product in consumer use or any vessel.

A **HAZARDOUS SUBSTANCE** means any substance, element, compound, mixture, solution, hazardous waste, toxic pollutant, hazardous air pollutant, or imminently hazardous chemical substance or mixture designated pursuant to the Clean Water Act (CWA), CERCLA, Safe Drinking Water Act (SDWA), Clean Air Act (CAA) or Toxic Substances Control Act (TSCA). The term does not include petroleum products, natural gas, natural gas liquids, liquefied natural gas, synthetic gas or mixtures of natural and synthetic gas.

The LIMITATIONS ON RESPONSE provisions of the NCP [40 CFR 300.400(b)] states that removals shall not be undertaken in response to a release: of a naturally occurring substance in its unaltered or natural form; from products that are a part of the structure of, and result in exposure within, residential buildings or business or community structures; or into public or private drinking water supplies due to deterioration of the system through ordinary use.

NCP is the National Oil and Hazardous Substances Pollution Contingency Plan 40 CFR §300-302.

POLLUTANT or CONTAMINANT includes, but is not limited to, any element, substance, compound, or mixture, including disease-causing agents, which after release into the environment and upon exposure, ingestion, inhalation, or assimilation into any organism, either directly from the environment or indirectly by ingestion through food chains, will or may reasonably be anticipated to cause death, disease, behavioral abnormalities, cancer, genetic mutation, physiological malfunctions or physical deformations, in such organisms or their offspring. The term does not include petroleum products, natural gas, natural gas liquids, liquefied natural gas, synthetic gas or mixtures of natural and synthetic gas.). [40 CFR 300.5]

RCRA is the Resource Conservation and Recovery Act of 1976, Public Law 94-580, 40 CFR 250-299

A **RELEASE** is defined as any spilling, leaking, pumping, pouring, emitting, emptying, discharging, injecting, escaping, leaching, dumping, or disposing into the environment (including the abandonment of barrels, containers, and other closed receptacles containing any hazardous substances or pollutant or contaminant), but excludes: workplace exposures; engine exhaust emissions; nuclear releases otherwise regulated; and the normal application of fertilizer. For purposes of the NCP, release also means threat of release. [40 CFR 300.5]

A **VESSEL** is defined as any description of watercraft or other artificial contrivance used, or capable of being used, as a means of transportation on water other than a public vessel. [40 CFR 300.5]

III. REMOVAL SITE EVALUATION CRITERIA (40 CFR 300.410[E])

A. IS THERE A RELEASE OR THREAT OF RELEASE AS DEFINED BY THE NCP? YES X or NO ___ UNKNOWN ___

EXPLAIN:

Elevated levels of lead are present above residential RSK levels. Levels of arsenic, zinc, and cadmium were also identified associated with elevated lead levels. Multiple residential yards and one elementary school yard were identified during the PRE and previous investigations to be impacted with lead levels above residential RSKs.

B. IS THE SOURCE A FACILITY OR VESSEL AS DEFINED BY THE NCP? YES X or NO ___ UNKNOWN ___

EXPLAIN:

The exact source of the elevated lead is unknown but is suspected to be from former smelter operations at the United Zinc #1 smelter which is located in the center of the site. Iola was a historic center of smelter activity in the early 1900s.

C. DOES THE RELEASE OR THREAT OF RELEASE INVOLVE A HAZARDOUS SUBSTANCE, POLLUTANT, OR CONTAMINANT AS DEFINED BY THE NCP? YES X or NO ___ UNKNOWN ___

EXPLAIN:

Lead, arsenic, cadmium and zinc are hazardous substances as defined in § 302.4 of the NCP.

D. IS THE RELEASE SUBJECT TO THE LIMITATIONS ON RESPONSE? YES ___ or NO X UNKNOWN ___

EXPLAIN:

No limitations on response exist at the site.

E. DOES THE QUANTITY OR CONCENTRATION WARRANT FURTHER REMOVAL RESPONSE OR REMOVAL SITE EVALUATION: YES X or NO ___ UNKNOWN ___

EXPLAIN:

Multiple residential yards and one elementary school yard were identified with lead levels above KDHE's residential RSK concentration of 400 mg/kg.

F. HAS A PRP BEEN IDENTIFIED? YES ___ or NO X

CURRENT OWNER: Varied

CURRENT OPERATOR: Varied

PAST OWNERS: United Zinc and Chemical, William Lanyon, Standard Acid Company

G. WHAT IS THE CURRENT LAND USE AROUND THE FACILITY?

RESIDENTIAL X COMMERCIAL X RECREATIONAL ___ INDUSTRIAL ___ AGRICULTURAL ___

WHAT IS THE FUTURE ZONING OF THE AREA AROUND THE FACILITY?

RESIDENTIAL X COMMERCIAL X RECREATIONAL INDUSTRIAL AGRICULTURAL

H. REGULATORY/OPERATIONAL HISTORY OF THE SITE:

The site property is a mixed commercial and residential area along Highway 54 in Iola. Smelters began operating in the site area in the late 1800s with the advent of natural gas production in the area. A more detailed history is given in the PRE Report. The KDHE efforts to date have not identified a viable PRP.

IV. CONDITIONS TO WARRANT REMOVAL (940 CFR 300.415[b][2]):

A. IS THERE AN ACTUAL OR POTENTIAL EXPOSURE TO HAZARDOUS SUBSTANCES, OR POLLUTANTS, OR CONTAMINANTS? DEFINE THE MEDIA, PATHWAY AND RECEPTOR:

GROUND WATER: YES NO X UNKNOWN RECEPTOR: local ground water

EXPLAIN: The site property and adjacent areas are supplied with water from the City of Iola. No private wells were located within one mile of the site.

SURFACE WATER YESX NO UNKNOWN RECEPTOR: Environmental

EXPLAIN: No surface water release has been documented. Elm and Rock Creeks are located within one mile of the site, and both have had historical sediment impacts from heavy metals attributed to smelter sites.

SOIL YES X NO UNKNOWN RECEPTOR: Residents, workers, students

EXPLAIN: Residential, non-residential, and sensitive receptor (elementary school) impacts were identified. Elevated lead detections are located in a fairly widespread area at the site. The extent of lead (and associated elevated arsenic, cadmium, and zinc) were not fully delineated in this PRE or the previous investigations

WASTE YES X NO UNKNOWN RECEPTOR:

EXPLAIN: Residual slag can be found scattered across the site area, mostly at the former United Zinc #1 smelter works north of Highway 54.

AIR YES NO UNKNOWN X RECEPTOR:

EXPLAIN: The lead detections may also potentially due to historic air-borne transmission from the smelter works or dust from rail and truck transport of ore/slag/spelter at the site.

B. IS THERE ACTUAL OR A POTENTIAL FOR CONTAMINATION OF DRINKING WATER SUPPLIES?

EXPLAIN: A low potential for ground water contamination is present since local ground water is not used for drinking water.

C. ARE THERE HAZARDOUS SUBSTANCES, POLLUTANTS, OR CONTAMINANTS IN DRUMS, BARRELS, BULK STORAGE CONTAINERS OR TANKS?

EXPLAIN: No abandoned hazardous substance containers were identified at the site.

D. ARE THERE HIGH LEVELS OF HAZARDOUS SUBSTANCES, POLLUTANTS, OR CONTAMINANTS IN NEAR-SURFACE SOILS? SURFACE SOIL CONTAMINATION? SURFICIAL WASTES PRESENT?

EXPLAIN: Several samples indicate elevated levels of lead and associated heavy metals in residential yards and an elementary school playground.

E. SITE ACCESSIBILITY: SECURE ACCESS LIMITED X READILY ACCESSIBLE

EXPLAIN: The site is easily accessible to all contaminated areas.

F. ARE THERE CONDITIONS ON SITE WHICH MAY BE SUSCEPTIBLE TO IMPACT FROM ADVERSE WEATHER CONDITIONS?

EXPLAIN: No adverse impacts were identified.

G. IS THERE A THREAT OF FIRE OR EXPLOSION?

EXPLAIN: No ignitable wastes were observed during the PRE.

H. IS THERE A POTENTIAL FOR OTHER FEDERAL OR STATE RESPONSE MECHANISMS? IF SO, IDENTIFY THE APPROPRIATE PROGRAM:

No PRPs were identified, and no state program is available for response actions.

I. ARE THERE SENSITIVE ENVIRONMENTS THAT MAY BE ADVERSELY IMPACTED BY THE SITE?

EXPLAIN: An elementary school and residential yards with younger children are present in the site area.

J. ARE THERE OTHER CONDITIONS OR FACTORS WHICH POSE A THREAT?

The proximity of other residential areas to the school and other identified areas warrants further evaluation as well. The area of impacted residences may be much larger.

V. POTENTIAL REMOVAL ACTIONS (940 CFR 300.415[D]): ***The following identifies potential removal actions which may be determined to be appropriate pending further review and study. The proposed actions should be considered preliminary proposals and are subject to change.***

SITE SECURITY: **EXPLAIN:** The site is currently not fenced.	YES X	or NO ___
DRAINAGE CONTROL: **EXPLAIN:** No significant surface water impact identified.	YES ___	or NO X
STABILIZATION OR REMOVAL OF SURFACE IMPOUNDMENTS: **EXPLAIN:** No surface impoundments are present.	YES ___	or NO X
CAPPING OF CONTAMINATED SOIL: **EXPLAIN:** Significant area of contaminated soil were identified; however capping could likely only occur in the non-residential portions of the site.	YES X	or NO ___
USE OF CHEMICALS TO CONTROL/RETARD SPREAD OF CONTAMINATION: **EXPLAIN:** Phosphate stabilizing agents may be helpful in rendering deeper soil contamination less susceptible to biological intake.	YES X	or NO ___
CONTAMINATED SOIL EXCAVATION: **EXPLAIN:** The most expedient method of response for the residential yards and McKinley School is likely excavation followed by replacement with clean backfill and seeding.	YES X	or NO ___
REMOVAL OF DRUMS, TANKS, OR BULK STORAGE CONTAINERS: **EXPLAIN:** No drums or containers are present.	YES ___	or NO X
CONTAINMENT, TREATMENT, OR DISPOSAL OF HAZARDOUS SUBSTANCES, POLLUTANTS, OR CONTAMINANTS: **EXPLAIN:** Significant areas of contaminated soil were identified.	YES X	or NO ___
PROVIDE ALTERNATIVE WATER SUPPLIES: **EXPLAIN:** No private water wells are located at the site.	YES ___	or NO X

VI. REMOVAL SITE EVALUATION DETERMINATION AND REMOVAL PRELIMINARY ASSESSMENT FINDINGS AND RECOMMENDATIONS:

REMOVAL ACTION/ASSESSMENT/FURTHER REMOVAL SITE EVALUATION CONSISTENT WITH §§ 300.410-300.415 OF THE NCP RECOMMENDED:	YES X	NO ___
FURTHER INTEGRATED CERCLA REMEDIAL SITE EVALUATION/RESPONSE CONSISTENT WITH THE NCP RECOMMENDED:	YES X	NO ___

(Cite one or more of the criteria from SECTION III - REMOVAL SITE EVALUATION CRITERIA, as the basis for the above determination)

X	RELEASE OF HAZARDOUS SUBSTANCES PRESENT		NOT A FACILITY OR VESSEL

X	HAZARDOUS SUBSTANCE OR POLLUTANT OR CONTAMINANT		SUBJECT TO RESPONSE LIMITATIONS
X	SUFFICIENT QUANTITY OR CONCENTRATION		WILLING/CAPABLE PRP RESPONSE
X	ACTUAL OR POTENTIAL EXPOSURE THREATS		DRUMS, BARRELS OR BULK CONTAINERS NOT PRESENT
X	HIGH LEVELS OF CONTAMINANTS IN SURFACE SOILS		SITE SUSCEPTIBLE TO ADVERSE WEATHER CONDITIONS
	THREAT OF FIRE OR EXPLOSION		REFERRED TO ANOTHER PROGRAM

(Identify one or more of the removal actions listed in Section V. POTENTIAL REMOVAL ACTIONS, as examples of the types of response actions which are recommended) NONE RECOMMENDED

X	SITE SECURITY - ACCESSIBILITY		DRAINAGE CONTROL
	IMPOUNDMENT STABILIZATION	X	SOIL CAPPING
X	CHEMICAL CONTROLS	X	SOIL EXCAVATION
	REMOVAL OF DRUMS, BARRELS, ETC.	X	CONTAIN THREAT/DISPOSE OF WASTES
	ALT. DRINKING WATER SUPPLIES	X	SURROUNDINGS/OTHER (EXPLAIN)

COMMENTS: Extensive areas of contaminated soil are present at the site.

VII. FIELD METHODS AND PROCEDURES: See RSE Report

VIII. FINAL REMARKS AND RECOMMENDATIONS

The significant areas of observed lead and other heavy metal contamination in soils, with residential and sensitive receptor exposure, warrant further assessment and consideration of a time-critical removal action consistent with the NCP.

Appendix G: *Residential Yard Soil Sampling Report: United Zinc #1, Iola, Kansas*

Prepared by Terranext, LLC for KDHE, June 27, 2005

Site: United Zinc #1
ID # KSN000705026
Break: 1.0
Other: 6-27-05

40249507
SUPERFUND RECORDS

TERRANEXT
A Woman Owned Business Enterprise

13202 West 98th Street, Lenexa, KS 66215

June 27, 2005

Terranext Project No. 17102464

Ms. Bridget Wilson
Bureau of Environmental Remediation
Kansas Department of Health and Environment
1000 SW Jackson, Suite 410
Topeka, Kansas 66612-1367

RE: Residential Yard Soil Sampling Report
United Zinc #1, Iola, Kansas
KDHE Project Code: C3-001-71726

Dear Ms. Wilson:

Terranext, LLC (Terranext) mobilized to Iola, Kansas on May 31 and June 1, 2005 to collect soil samples from residential yards between two sensitive receptors identified near the United Zinc #1 Site, as requested by the Kansas Department of Health and Environment (KDHE). The soil sampling activities were completed following the procedures outlined in the KDHE-approved work plan dated May 10, 2005.

Background Information

The United Zinc #1 Site is located on the north side of Highway 54 at Kansas Drive in Iola, Kansas. According to historical information obtained from KDHE, the United Zinc #1 Site is comprised of 10 parcels of land, which collectively equal approximately 17 acres. In 2003 and 2004, smelter waste was observed on the United Zinc #1 Site, the volume of which was estimated at 1,800 cubic yards. Based on these observations, soil, ground water, sediment, surface water, and smelter waste samples were collected from the United Zinc #1 Site and surrounding area in 2004 to determine the potential impact from former smelter operations at the United Zinc #1 Site. Elevated concentrations of metals above the Risk-Based Standards for Kansas (RSK) were detected in the soil, ground water, sediment, and smelter waste samples.

In addition, two sensitive receptors, the Iola Preschool and the McKinley School No. 10, were identified in the vicinity of the United Zinc #1 Site. The Iola Preschool is located northeast of the United Zinc #1 Site at 819 Kansas Drive and the McKinley School is located southwest of the United Zinc #1 Site at 209 South Kentucky Street. Elevated concentrations of metals above the RSK values were detected in the soil samples collected from these sensitive receptors in 2004.

RECEIVED
JUL 0 7 2005
BUREAU OF
ENVIRONMENTAL REMEDIATION

Telephone: (913) 894-4000 Fax: (913) 894-5983 www.terranext.net

Soil Sampling Activities

Prior to initiation of field activities, KDHE obtained access to the city rights-of-way (ROW) from the City of Iola. On May 31, 2005, Terranext mobilized to Iola, Kansas and obtained copies of aerial photographs and maps of the area from the City of Iola. Using these maps, Terranext randomly selected 50 residential yards to sample between the United Zinc #1 Site and the two sensitive receptors previously identified (Iola Preschool and McKinley School). The dashed lines on Figure 1, Attachment I represent the residential yard sampling area developed by Terranext and approved by KDHE. On May 31 and June 1, 2005, Terranext collected discrete soil samples from the randomly selected residential yards within this area (Figure 2) in the city ROW from a depth interval of 1 to 3 inches below ground surface (bgs) using dedicated stainless steel spoons. During soil sampling activities, Terranext also recorded global-positioning satellite (GPS) coordinates for each residential property sampled (Attachment IV).

Following sample retrieval, the soil samples were placed in appropriate laboratory containers, packed on ice in a cooler, and transported to the laboratory for arsenic, cadmium, lead, and zinc analyses by EPA Method 6010. In addition to the primary samples, two duplicate soil samples were collected (designated "417 Tower" and "402 Egypt") and submitted along with the primary samples ("431 Eisenhower Drive" and "419 Eisenhower Drive", respectively) to the laboratory for arsenic, cadmium, lead, and zinc analyses by EPA Method 6010. Since the target constituents were not volatile organic compounds (VOCs), a trip blank was not included in the cooler for laboratory analysis. The duplicate quality assurance/quality control (QA/QC) samples were included on the chain-of-custody forms.

Soil Quality

Figures 3 through 6, Attachment I, illustrate the extent of arsenic, cadmium, lead, and zinc impacts to soil during the soil sampling event. A copy of the laboratory analytical report is included in Attachment III.

<u>Arsenic</u>

Arsenic was detected in 36 of the 52 soil samples at concentrations ranging from 6.56 milligrams per kilogram (mg/kg) in the 418 Eisenhower Drive sample to 35.7 mg/kg in the 102 South Tennessee Street sample. As indicated in Table 1, Attachment II, 18 of the arsenic concentrations exceed the RSK value of 11 mg/kg. The highest concentrations of arsenic were detected to the north of the United Zinc #1 Site along Willow Drive between Tennessee Street and Vermont Street and to the south of the United Zinc #1 Site at the southwest corner of the intersection of Madison Street and Tennessee Street (Figure 3, Attachment I).

Cadmium

Cadmium was detected in all of the soil samples at concentrations ranging from 0.831 mg/kg in the 418 Eisenhower Drive sample to 31.3 mg/kg in the 304 North Vermont Street sample. As indicated in Table 1, Attachment II, none of the cadmium concentrations exceed the RSK value of 39 mg/kg. The cadmium concentrations are illustrated on Figure 4, Attachment I.

Lead

Lead was detected in all of the soil samples at concentrations ranging from 51.2 mg/kg in the 418 Eisenhower Drive sample to 2,020 mg/kg in the 107 South Ohio Street sample. As indicated in Table 1, Attachment II, 18 of the lead concentrations exceed the RSK value of 400 mg/kg. The highest concentration of lead north of the United Zinc #1 Site (1,800 mg/kg) was detected at the northwest corner of the intersection of Willow Drive and Vermont Street (Figure 5, Attachment I). The highest concentrations of lead south of the United Zinc #1 Site (greater than 1,000 mg/kg) were documented along Ohio Street between Highway 54 and Broadway Street, as depicted on Figure 5, Attachment I.

Zinc

Zinc was detected in all of the soil samples at concentrations ranging from 199 mg/kg in the 24 East Madison Street sample to 8,610 mg/kg in the 304 North Vermont Street sample. As indicated in Table 1, Attachment II, none of the zinc concentrations detected exceed the RSK value of 23,000 mg/kg. The zinc concentrations are illustrated on Figure 6, Attachment I.

A copy of the field notes for the sampling event is included in Attachment IV and a photograph log of the residential yard soil sampling area is included in Attachment V. Should you have any questions or require additional information, please call this office at (913) 894-4000.

Sincerely,

TERRANEXT

Kara M. Taylor

Kara M. Taylor
Project Geologist

James E. Graham

James E. Graham, L.G.
Manager, Midwest Operations

ATTACHMENT I

FIGURES